C H A P T E R 5

Disaster Management

General

From historical times humankind has been subjected to disasters of varying magnitude, both natural and man-made. Besides the Tsunami of December 2004, a disaster of the highest magnitude faced by Sri Lanka, displacement of people caused by the conflict-situation which prevailed until recently in the Northern and Eastern districts and heavy floods and severe droughts which were experienced at various times, have been disasters of considerable extent, encountered by our country.

5.1 Definition of a disaster

- A disaster is a serious disruption of the functioning of society, causing widespread human, material or environmental losses, <u>which exceed the ability of the affected people to cope using their own resources.</u>
  (*Source: World Health Organization*)

- Simplified, a disaster is an emergency in which a community cannot cope using its own resources.

Sri Lanka Disaster Management Act No. 13 of 2005

Provides for a
- national council for disaster management
- The disaster management centre
- Appointment of technical advisory committees
- Preparation of disaster management plans
- Declaration of a state of disaster
- Award of compensation
- Matters connected therewith or incidental thereto

'Disaster' -   as interpreted in the Act

In this act, unless the context otherwise requires, 'disaster' means the imminent or actual occurrence of a natural or man-made event, which endangers or threatens to safety or health of any person or a group of persons in Sri Lanka or which destroys, damages or threatens to destroy or damage property.

The Ministry of Healthcare & Nutrition, Sri Lanka, has established a Health Sector Disaster Preparedness & Response System, its vision being;

"Least human suffering due to natural and man-made disasters through rapid and effective contributions of health sector "

Classification of Hazards

- **Hydro-meteorological hazards:** storm, tropical cyclones, floods, sea surge, drought
- **Geological hazards:** volcanic eruption, earthquake, tsunami, landslides, avalanche
- **Others:** forest fires
- **Biological hazards:** outbreaks, deliberate use of biological agents
- **Technological hazards:** chemical incidents: deliberate use of chemical agents, chemical spills; structure fires; radiological incidents; building collapse; transport crashes; infrastructure failure; pollution
- **Societal hazards:** complex emergencies; armed conflict; acts of "terrorism"; mass gatherings; stampedes; social unrest Disasters/ hazards can be classified as man-made and natural or as major and minor too.

Some terms with relevance to 'a disaster '

Hazard
Any potential threat to public safety and / or public health

Risk
Anticipated consequences of a specific hazard interacting with a specific community (at a specific time)

Emergency
An actual threat to public safety and / or public health

Vulnerabilities
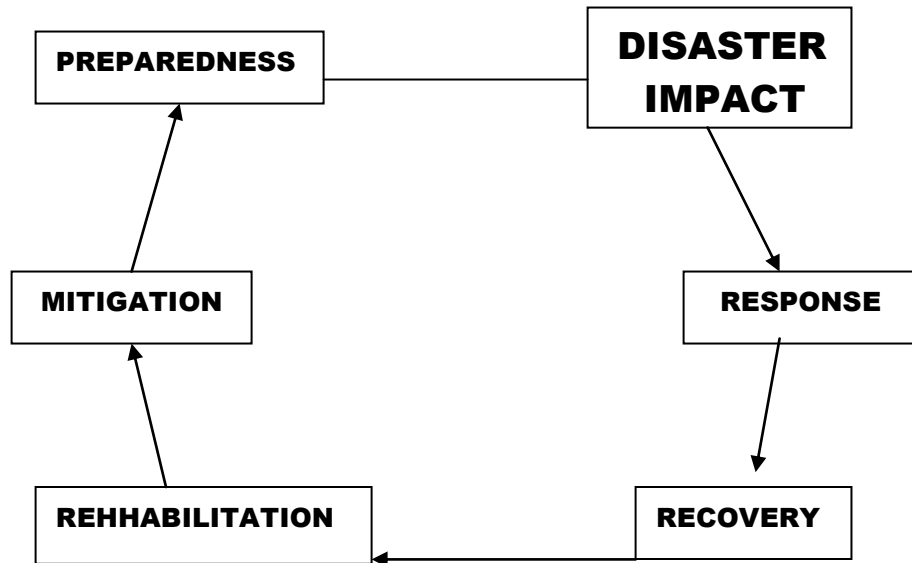Factors which increase the risks arising from a specific hazard in a specific community

Disaster management

Disaster management is a complex series of activities that include risk assessment, prevention measures and preparedness to cope with future disasters, emergency response to a disaster, recovery and reconstruction. Good development and community preparedness can reduce the impact of a disaster especially for the most vulnerable people, such as those living in hazard-prone areas with few financial resources, to help them recover if they lose their means of livelihood.

Disaster cycle and the different phases of disaster management

Disaster cycle

All disasters follow a cyclical pattern as follows;

```
  ┌─────────────────┐                    ┌─────────────────┐
  │  PREPAREDNESS   │────────────────────│    DISASTER     │
  └─────────────────┘                    │     IMPACT      │
         ▲                               └─────────────────┘
         │                                        │
  ┌─────────────────┐                             ▼
  │   MITIGATION    │                    ┌─────────────────┐
  └─────────────────┘                    │    RESPONSE     │
         ▲                               └─────────────────┘
         │                                        │
  ┌─────────────────┐                             ▼
  │ REHHABILITATION │◄───────────────────┌─────────────────┐
  └─────────────────┘                    │    RECOVERY     │
                                         └─────────────────┘
```

In the preparedness phase

- PHI studies his area and gains an idea about any possible risks and vulnerabilities
- A Plan of Action is kept ready (with Line of Command identified) for use if necessary
- Identifies sources of volunteer help if required
- Identifies what resources need to be in place to respond to a particular kind of event

Much can be done to prepare for future disasters by:
- Modifying or removing the causes of any likely hazard (eg. - building houses away from landslide prone areas)
- Taking measures to reduce the effects of a hazard (egs:- developing response plans, defining the roles and training of personnel for emergency services, educating the public regarding the course of emergency action to be taken)

In the response phase

- The mobilization of the necessary emergency services and first responders in the disaster area
- A well rehearsed emergency plan developed
- Victims of the disaster are categorized according to degree of severity of injury or illness and the availability of medical and transport facilities (triage)

In the recovery and rehabilitation phase

- The aim is to restore the affected area to its previous state and the recovery issues are concerned with issues and decisions that must be made only after immediate needs are addressed.

- Efforts are primarily concerned with actions that involve rebuilding destroyed property, re-employment and the repair of other essential infrastructure.

In the mitigation phase

- While it is impossible to prevent the occurrence of most natural hazards, it may be often possible to minimize their damaging effect (egs:- having a plan where to move people in advance, in areas subjected to regular flooding)

3 major tasks of public health in disaster management

- Collection, evaluation and dissemination of information
- Cooperation and collaboration with other disciplines
- Prevention of disease and continuity of care

5.2 Role of the Public Health Inspector in Disaster Management

Disasters have a negative impact on health and greatly increase the demand for public health interventions.

Health Effects of Disasters

The health consequences of hazards include:
- Increased deaths and injuries
- Population displacement, including missing persons
- New cases of disease and disability
- Increased number of cases of psychological and social behavioural disorders
- Possible food shortages and nutritional deficiencies
- Contamination or injury of relief personnel
- Environmental health hazards
- Damage to healthcare facilities and other health infrastructures
- Disruption of routine health services
- Disruption of routine disease surveillance
- Diversion of development resources to emergency relief

How Hazards can affect communities

- Immediate increase in cases of illness, disability, and death
- Psychosocial stress
- Possible environmental pollution
- Exposure to toxic substances
- Damage to or loss of essential life support services (water, food, shelter)

- Displacement of population
- Breakdown in security
- Breakdown in communication networks and information flows
- Damage to and loss of facilities, services, and staff
- Risk of infection or contamination for response and relief personnel
- Delay or lack of access to health services
- Increase burden to health personnel and facilities
- Economic impact

Action to be taken in the Response stage

- Search and rescue - finding those who may be trapped under debris
- Assessment of needs - working out what is required, in what quantities and for whom
- Health interventions –

    Providing medical care - mass casualty management
    - first- aid
    - triage -(Victims of the disaster are categorized according to degree of severity of injury or illness, and the availability of medical and transport facilities)
    - transport
    - pre-hospital care
    - in-patient care
    - post care follow-up

    Preventing the spread of disease

    - immunization
    - provision of safe water & food
    - disposal of human excreta
    - disposal of waste
    - burial of the dead
    - disease vector control

- Basic needs - procuring and distributing food, shelter and clothing

Emergency Planning for the Health Sector includes;
Health assessment
Incident management / response coordination
Communicable diseases
Mass casualty management
Reproductive health
Environmental health
Nutrition
Mental health

5.3 Assessments

Different assessments to be done.

TYPE	WHEN	WHAT	HOW
Rapid Reconnaissance	immediately after a disaster	a quick, preliminary inspection of the disaster area	• satellite imagery • flights • mapping • drive / walk through
Rapid Health Assessment	As soon as it is possible, to go to the area	a quick collection of information to confirm the emergency, measure the impact, identify health needs and guide response	• visual inspection • analysis of records • interview of key informants • rapid surveys (MUAC*, etc.)
Surveys	When the situation stabilises and response has been activated	A detailed study in which information is systematically collected in a sample of population (morbidity, mortality, nutrition, KAP*)	• Probability sampling • Non-probability sampling

*Mid Upper Arm Circumference

Rapid health assessment

PHI plays a key role in the rapid health assessment.

What is Rapid Health Assessment?
"Collection of subjective and objective information in order to measure <u>damage</u> and identify those basic <u>needs</u> of the affected population that require <u>immediate</u> response."
(Source: Rapid Health Assessment protocols for emergencies, WHO, 1999)

### Objectives of Rapid Health Assessments

Collection objectives

- identify existing and potential public health needs
- identify gaps and problems in meeting urgent medical needs
- assess existing and potential environmental risk factors
- assess resource and logistics needs
- identify managerial, coordination and organisational gaps, overlaps and problems

Analysis objectives
- set priorities for response / relief
- set priorities for information dissemination and communication
- identify resources needed to meet priorities – external and internal
- identify additional information needs for the response and for planning recovery and reconstruction

Flow of information

Assessor: is the Range Public Health Inspector

PHI → MOH → DPDHS → PDHS → DGHS (DDG- PHS),

Director Health Information   Other stakeholders

(feed back)
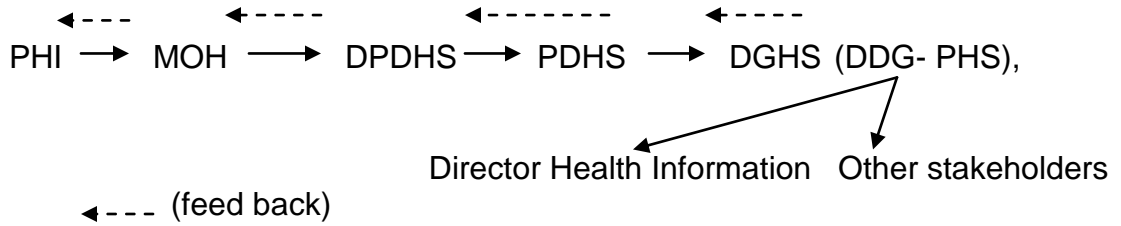
Reporting the results of the Rapid Assessment

Rapid assessment: Sanitation Needs

A. Site Information

1. Location: …………………………………………………………..
2. Name of the Village/s: ……..……………………………………
3. DS Division: ……………….   GND: …………………………
4. MOH Area: …………………   PHI Range: ……………………
5. District: …………   Province: …………………….....

B. Demographic Information

1. Total Land Area: sq.km
2. Total population:
                            Male   Female
3. Under 5 year population

C. Excreta Disposal

1. Toilet facilities: availability   Yes / No
          If 'yes',
2. Total number of toilets
     (i) Type of toilet-   Water sealed / Pit -   Direct Pit /Trench
     (ii) Number usable
     (iii) Number unusable & Number repairable
     (iv) Separate toilets for males and females   -   Yes / No
                If separate toilets exist   Number for Males /Females
     (v) Number of urinals

3. Number of persons per toilet: Males   Females
4. Cleanliness: Satisfactory / Unsatisfactory
5. Continuous water supply to the toilets: Available / Not available
6. Lighting (24 hours):   Available / Not available
7. Proper excreta disposal for children
     less than 5 years old –   Available / Not available

8. Is there a separate sanitary room for ladies?   Yes / No
9. Hygiene kits provided to the ladies   Yes / No
10. Regular cleaning of toilets (3 times/ day)   Yes / No
11. Disinfectants available   Yes / No
12. Person responsible for sanitation practice appointed   Yes / No

If 'yes', who is responsible: …………………………… ……….

D. Bathing and Washing

1. Separate rooms for bathing and washing available   Yes / No
2. Separate rooms for males and females available   Yes / No
3. Adequacy-   for males   Yes / No:
                      for females   Yes / No
4. Availability of continuous water supply   Yes / No
5. Adequate number of buckets available   Yes / No
6. Soap / washing powder available   Yes / No

E. Waste water drainage

1. Is there a drainage system?   Yes / No
    If 'yes',
2. Is the drainage system draining into a soakage pit?   Yes / No
3. Is the pit covered?   Yes / No
    If 'no',
4. Does the waste water contaminate water sources?   Yes / No
5. Are there any water collections on the ground?   Yes / No

F. Solid Waste Disposal

1. Agency responsible for solid waste disposal   ………………………
2. Availability of waste collecting bins -   Yes / No
3. Method of disposal   Dumping / Burying / Burning/
                                         Removed by Local Agency/
                                         Other (specify)
4. If removed by Local Agency, how often?
            Daily/once in 2 days/ once a week/other
5. Fly breeding sites present   Yes / No
6.   Presence of stray animals   Yes / No

G. Hygiene promotion

1. Whether there is a hygiene promoting person/ team?   Yes / No
2. Are there any regular hygiene promotion activities?   Yes / No
3. Display/ availability of hygiene promoting IEC materials at the
    site?   Yes / No

Comments:..
…………………………………………………………………...............

Risk Management

It is a comprehensive <u>strategy for reducing hazards and its consequences to public health and safety</u> of communities by:

- **preventing exposure** to hazards (target = hazards)
- **reducing vulnerabilities** (target group = community)
- **developing response and recovery capacities** (target group = community and responding agencies)

Risk assessment

- considers the <u>range of sources of risk</u>, including: natural hazards, technological hazards, biological and societal hazards
- identifies <u>populations most at risk</u> due to higher levels of vulnerability
- analyses risks in terms of <u>likelihood</u> and <u>consequences</u> (quantitatively and qualitatively)
- determines <u>priorities</u> across <u>hazards</u> and <u>vulnerability</u>
- <u>policies, emergency response and recovery plans, and capability development plans</u> are developed based on risk assessment
- risk assessment is <u>monitored and reviewed regularly</u>
- risk assessments are <u>shared</u> among government, private sector and non-governmental organizations and individuals involved in the management of risks

  - within and between levels of administration
  - within and between sectors (such as health, emergency management and security)
  - communities
  - organizations

Response towards Risk

- All-hazard response plans
- Specific plans
- Health Services (eg. mass casualty management)
- Specific types of emergencies (eg. chemical)
- Locations (eg. Airports)

Emergency Medical Services (EMS) System

The Emergency Medical Services (EMS) System is a <u>network of resources </u>linked together for the purpose of providing emergency care and transport of victims of sudden illness or injury to a medical facility for definitive care.

Key stakeholders are;
- Healthcare Facilities
- Ambulance Services
- Fire Department
- Security Personnel
- Laypersons / Community
- Volunteer Groups
- Red Cross Organization
- Aid/ material, equipment etc.

Hospital Emergency Incident Command System (HEICS)

The functions of the Hospital Emergency Incident Command System (HEICS) include:

1. Activation of the plan by the "designated person"
2. Control and coordination of hospital activities
3. Provision of additional resources / Redistribution of available resources
4. Liaison with EOC and other hospitals
5. Liaison with the evacuation centre

Handling displaced populations

A Range PHI may encounter the problem of looking after the welfare of displaced populations, resulting either from,

- A disaster which occurred within his work area
        or
- Arrival in his work area, a population displaced following a disaster in another area

The public health effects of a disaster will generally be felt more by persons displaced into an outside area following the disaster, than by people displace within the same area. In case of the former situation the displaced persons will be more helpless, as they are among a strange community.

Collection of data

Collection of baseline data in a camp accommodating displaced persons

- Basic information about displaced persons
- Status of health in the camp
- Status of persons with chronic diseases and disabilities

Collection of information about the health activities and logistic requirements

- Health promotional activities planned and conducted in the camp
- Requirement of Logistics and Supplies

Information about displaced people

Name of the camp……………………………………………..

Family No.	Name of the householder	Ethnicity	Name of the original village	Family members		00 – 05 Months	06 – 11 Months	12 – 23 Months	24 – 59 Months	05 – 09 years	10 – 24 years	24 – 60 years	>60 years	Pregnant mothers	Chronic diseases
				Male	Female										

Status of Health in the camp

Name of the camp…………………………………………………………….

Date	Time	Name & designation of inspecting person	Status of sanitation and personal hygiene									Action taken	Signature
			D	W	S	F	P	FI	R	M	C		

Key   **Gd = Good**   **Sat = Satisfactory**   **Un.Sat = Unsatisfactory**

D = Drinking water Supply   **W** = Water for washing purposes   **S** = Sanitary facilities   **F** = Food hygiene   **P** = Personal Hygiene
FI = Fly breeding places   **R** = Refuse disposal   **M** = Mosquito breeding places   **C** = No. of reported cases of communicable diseases

Health promotional activities planned and conducted in the camp

Name of the camp………………………………………………………….

	Name of the activity	Responsibility	Date & Time planned	Place of the activity	date & time conducted	Output of the activity

Status of persons with chronic diseases and disabilities

Name of the camp ………………………………………….

Family No.	Name of the patient	Age	Male/ female	Disease / disability	Treatment & care given	Special needs

5.4 Supplies and Logistics

Critical Health Sector Supplies
1. Medical equipments, dressings etc.
2. Drugs, vaccines
3. Sterilization and hospital equipments
4. Special foods
5. Surgical equipments
6. Personal protection equipments
7. Mosquito nets and insecticides
8. Chlorine / Tropical chloride of lime (TCL)
9. Shelter, communication material, transport, cold chain facilities and material
10. Equipment necessary for administrative matters and reporting
11. Items for personal care

Common Supplies Problems
1. Huge quantities of non-requested items can arrive
2. Many items may be <u>inappropriate</u> and <u>unnecessary</u>
3. Items arrive without <u>packing</u> lists or with no <u>labels</u>
4. Items are <u>not packed</u> properly and <u>unprotected</u> from the elements
5. Airport warehouses and other warehouses may not have adequate space to stock huge volumes of supplies suddenly arriving
6. Items are sometimes dispatched to locations which are easily reached by aircraft or truck and not to locations where they are mostly required
7. Items may arrive to the disaster area, at multiple sites<u>, in an uncoordinated way</u> and without prior notice of arrival
8. Items may arrive at the disaster area <u>unsorted and unclassified</u>
9. Many donated items may have to be <u>destroyed</u> and some items need special incinerators to do so

What is Logistics?
Logistics is a <u>system</u> which provides the means to acquire and deliver resources:
    a. To the **right** place
    b. At the **right** time
    c. In the **right** quantity
    d. At the **right** quality
    e. At the **right** price

Logistics Systems Requirements
1. Communication systems (radio, satellite phones etc.)
2. Transport systems (road, rail, air, sea)
3. Storage and Distribution systems
4. Utilities networks
   - Energy (Electricity, Gas, Fuel, Solar energy system)
   - Water supply systems
   - Waste disposal systems
5. People
   - Daily care, accommodation, working conditions
   - Security

Logistics management is a specialized area and there are people specially trained to handle supplies and logistics (i.e., Logistics Experts / Logistics Specialists).

5.5 Disaster Recovery Phase

"Disasters offer an opportunity for development."

Disaster Recovery: ... "focuses on how best to restore the capacity of the government and communities to rebuild and recover from crisis and to prevent relapses. In so doing, recovery seeks not only to catalyze sustainable development activities, but also to build upon earlier humanitarian programmes to ensure that their inputs become assets for development."
(source: United Nations Development Programme- 2001)

Medium-term Health Considerations for the Recovery Process
The necessary considerations that have to be taken into account:-
- contamination of food and water supplies
- emotional stress
- epidemic diseases - diarrhoea, measles etc.
- endemic diseases
- reduced health levels
- decline in nutritional status

Long-term Health Considerations for the Recovery Process

Psychosocial
Concurrent problems due to disaster - decrease in mental health services; increase in the incidence of common mental health problems
- Psycho- physiological
  - Fatigue, nausea, tremors, tics, profuse sweating, chills, dizziness, gastrointestinal upsets
- Behavioral
  - Sleep and appetite changes, increased substance abuse, hyper vigilance, ritualistic behavior, gait change, tendency to cry easily
- Emotional
  - Anxiety, depression, grief, irritability, feeling overwhelmed
- Cognitive
  - Decision making difficulties, confusion, impaired concentration, reduced attention span

Gender and Health
- Equity and diversity (equity = equal chances without discrimination)
  (diversity = difference from others)
- Discrimination
- Family planning and reproductive health services
- Safety of women and children
- Inclusion of women in reconstruction planning

Chronic illnesses
- Monitoring for delayed / long term impacts
- Continued health care services for long-term disabilities from the events

Emerging and Re-emerging illnesses
- Monitoring for delayed / ongoing health impacts
- Surveillance for potentially emerging and re-emerging endemic diseases or areas

Environment
- Clean-up, hazard reduction and environmental management at the incident site

Housing
- Permanent Accommodation
    - Access to regular Services
- Resettlement and / or Repatriation
    - Worst possible plan is to resettle

PHI needs to look into all the above mentioned aspects during disaster recovery stage.

Some advice to be followed when handling the recovery process

1. People begin almost immediately to re-house themselves and re-establish their social and economic networks after a disaster - build upon, don't obstruct community initiatives!
2. People have good ideas of what they want to do to rebuild their lives - take their views into account when planning for recovery!
3. Take into account the overall context and the changes in this context (political, economic, social and military)
4. Establish partnership with all key stakeholders
5. Use a 'zoom approach' (medium / long-term time frames, with short-term cycles)
6. Assess the functional health system elements of the affected community in relation to the community's health needs
7. Develop and formalise arrangements for the effective management of the recovery process
8. Facilitate the rehabilitation and improvement of affected infrastructures as quickly as possible
9. Facilitate the recovery of affected individuals (physical, social)
10. Ensure general understanding of planning process and programme (agencies, authorities and communities)
11. Describe organisational networks and structures appropriate to recovery process (different types and scale events)
12. Be reviewed on a regular basis
13. Incorporate performance indicators and measurable results into the plan, in order to readjust the strategy to the outcomes
14. Set out appropriate resourcing arrangements
15. Define responsibility for the range of specific services to be provided

5.6 How to Communicate Risk?

Communication about the existence of risk factors, to the persons who should be made aware of them, has to be done carefully.

Elements of Risk Communication

> **Who** says **what** to **whom**?
> Through **what channels?**
> With **what effects?**

How media can assist?

Media as a partner in emergency and disaster management, can:

- Assist in pre-crisis education
- Convey warnings
- Convey instructions or other information
- Reassure the public / Deal with the emotions
- Defuse inaccurate information / rumors
- Provide you with updated information
- Solicit and obtain help from others

Important contact details

Organization/Person	Address	Telephone	Website/ E-mail
Disaster Management Centre	Director General Room No 2- 222 Bandaranaike Memorial International Conference Hall (BMICH) Baudhaloka Mawatha, Colombo 7.	Tel:- 2670002 (Fax:- 2670079)	www.dmc.gov.lk dg@dmc.gov.lk
Disaster Preparedness and Response Unit, Ministry of Health	Ministry of Healthcare & Nutrition, 385, Ven. Baddegama Wimalawansa Thero Mawatha, Colombo 10.	060-2071073	
Health Emergency and Disaster Management Training Centre (HEDMaTC)	HEDMaTC, University of Peradeniya	081-2396550	hedmatc@pdn.ac .lk