



HEALTH SECTOR EMERGENCY PREPAREDNESS GUIDE

MAKING A DIFFERENCE TO VULNERABILITY

WORLD HEALTH ORGANIZATION
1998

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Preface

Emergencies and disasters affect all parts of the globe and cause harm to people, property, infrastructure, economies and the environment. Harm to people includes death, injury, disease, malnutrition, and psychological stress. If emergencies, and the hazards and vulnerability that cause them, are not effectively managed, then the goal of sustainable development is put at jeopardy. In particular, emphasis must be placed on preventing emergencies, and in preparing effective responses for emergencies, at the national and sub-national levels.

Despite this need, there has been a conspicuous lack of health sector guidelines on emergency preparedness. These guidelines fill this gap, and explain how to apply the principles and techniques of emergency preparedness at the national level. They present a clear, useful and systematic approach to the subject, that has been tested and proven in a number of countries in various regions.

The main themes of these guidelines are:

- using standard management techniques to reduce the effects of emergencies;
- ensuring multisectoral cooperation in emergency preparedness;
- encouraging emergency preparedness at all levels within a nation;
- assessing vulnerability before developing emergency plans, or implementing training programs; and,
- monitoring and evaluating emergency preparedness programs for appropriateness, effectiveness, and efficiency.

National and provincial emergency coordinators, and regional emergency focal points, are among our main target audience. Input from those responsible for implementing emergency preparedness programs will be used to validate the applicability and usefulness of these guidelines. This review will be conducted on a yearly basis in all regions.

We acknowledge with gratitude the generous financial support of the UK Department for International Development in the production of these guidelines. These guidelines are a milestone in the progress of countries towards self-sufficiency and dignity in the face of emergencies.

Dr. Reinaldo Flores
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Chapter 1

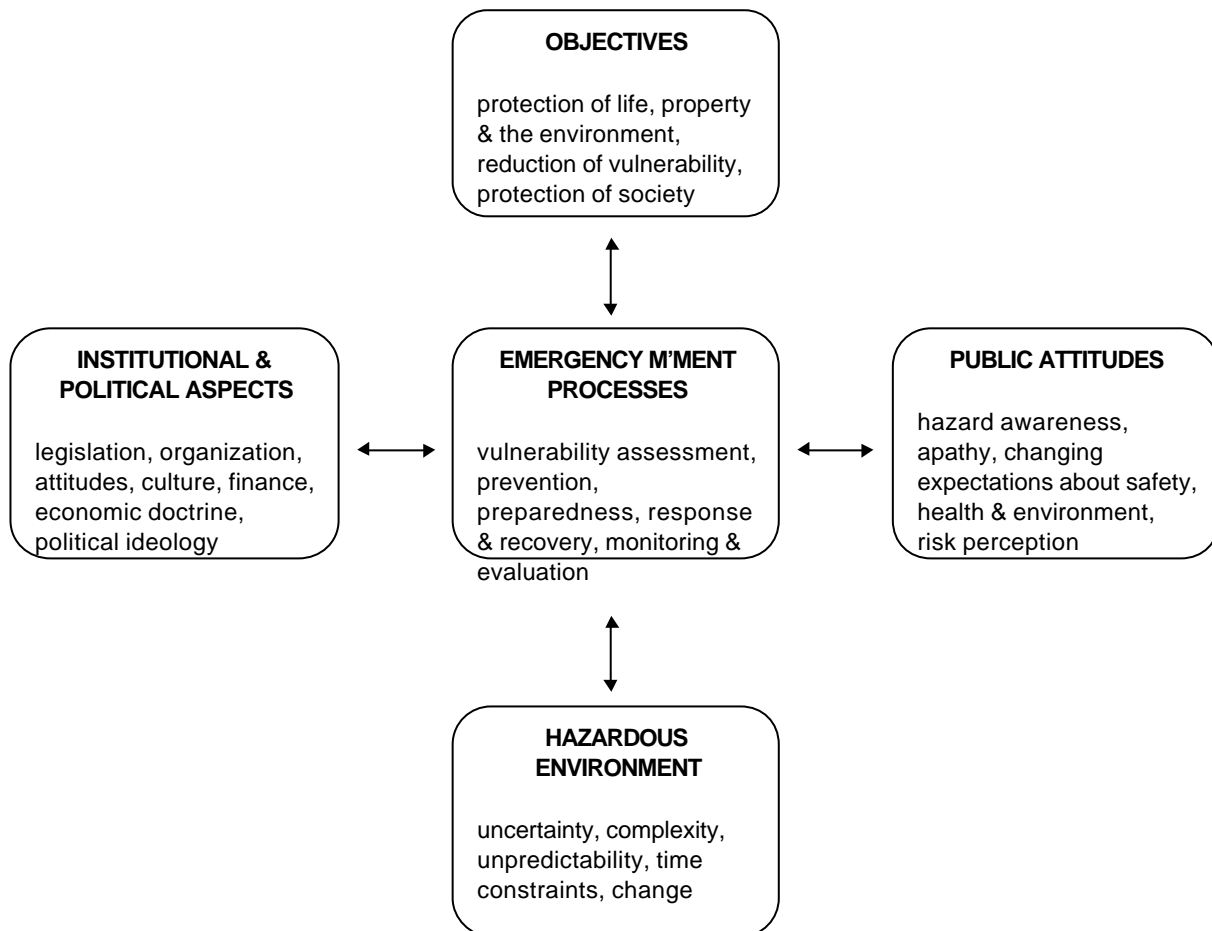
Introducing health sector emergency preparedness

This chapter outlines the context of emergency preparedness, the relationship between emergency preparedness and emergency management, and some elements and principles of emergency preparedness.

1.1 Context of preparedness process

Emergency preparedness does not exist in a vacuum. In order to succeed, emergency preparedness programs must suit their context. This context will vary from country to country, and from community to community, but some of the relevant aspects are shown in Figure 1.

Figure 1
Context of emergency preparedness¹



The broadest context for emergency management is sustainable development which involves managing the use and protection of natural and physical resources to enable the social, economic and cultural well-being of communities.

1.2 An emergency management framework

Emergency management is a range of activities to protect communities, property and the environment. These activities can be described by:²

COMPREHENSIVE	ALL HAZARDS
PREPARED COMMUNITY	MULTISECTORAL & INTERSECTORAL

- the ‘comprehensive’ approach;
- the ‘all hazards’ approach;
- the ‘multisectoral and intersectoral’ (or ‘all agencies’ or ‘integrated’) approach; and,
- the ‘prepared community’.

Comprehensive emergency management entails developing and implementing strategies for different **aspects** of emergency management, i.e. prevention/mitigation, preparedness, response and recovery, in the context of sustainable development. These aspects are not discrete, sequential phases, but overlap each other both in time and in scope.

Prevention and mitigation programs aim to reduce the likelihood or consequences of emergencies by changing the community or the environment in which the hazard exists. Such programs can involve structural strategies, for example the building of dikes or the strengthening of buildings, or could be non-structural, for example land use planning or economic diversity.

Preparedness programs enable organizations and communities to deal with emergencies effectively and appropriately. They to strengthen capacity and capability through intersectoral and sectoral planning processes.

Response and recovery¹ are strategies implemented during and after emergencies that have specific humanitarian and social objectives. Effective emergency preparedness programs ensure that response and recovery strategies lead to enhanced development. Emergencies may be viewed as a ‘springboard’ for development, in that they may create a situation where resources can be applied to improve the conditions of communities.

The management of emergencies is a process which should be part of the normal development plan of a country. Emergencies should not merely be responded to when necessary - the causes should be analyzed, and preventative programs and response and recovery strategies should be developed and implemented.

The **all hazards** approach concerns developing and implementing emergency management strategies for the full range of likely emergencies. This approach is useful because different hazards and emergencies can cause similar problems in a community, and such measures as warning, evacuation, medical services and community recovery are usually required during and following emergencies. Many hazards will, however, cause emergencies that require specific response and recovery measures, and will almost certainly require specific prevention programs.

The **multisectoral and intersectoral** approach means that all organizations, including government, private and community organizations, should be involved in emergency management. The context of emergency management for specific organizations varies, and may include:

¹ ‘Relief’ and ‘rehabilitation’ are subsets of response and recovery.

- protecting their own interests and personnel;
- protecting the community from hazards arising from the activities of the organization; and,
- providing a public service to protect the community from credible hazards.

If this approach is **not** used, emergency management is likely to be fragmented and inefficient.³ The multisectoral and intersectoral approach will also help to link emergency management to sustainable development, through the institutionalization of emergency management and the use of its principles in development projects.

A key constraint of the multisectoral approach is that emergency management does not duplicate normal government administration.

The concept of the **prepared community** concerns the application of the comprehensive, all hazards, and multisectoral and intersectoral approaches at the community or local level (typically the lowest level of government).

Emergencies affect the security and well-being of communities. The responsibility for maintaining the security and well-being of a community rests primarily with the individuals that make up a community. External assistance in emergency management may be expected, but should not be relied upon. Members of a community, community resources and the organizations and administrative structures of a community, should form the foundation of any emergency preparedness program. Community participation in emergency management should:

- allow the use of local knowledge and expertise;
- promote community awareness and education to minimize risk and increase preparedness;
- provide opportunities for participation in decisions which are made in relation to a community;
- ensure policies and practices that allow for self-determination and maximum community involvement in response and recovery planning;
- ensure cooperation between professional personnel and volunteer members of the community;
- make use of the existing structures, resources, and local networks wherever possible;
- make use of the community's own material and physical resources, in particular, local suppliers;
- promote active participation in the community's recovery; and,
- enable national and international organizations to channel resources directly to the community.

1.3 Some elements of emergency preparedness

Emergency preparedness consists of the following elements:

- legal frameworks and enabling policy for emergency management;
- the collection, analysis and dissemination of information on vulnerability;
- management systems for emergency preparedness;
- public awareness, and community participation; and,
- organizational and human resource development.

These elements should be created at community, provincial and national levels. A capacity in each of these areas is a pre-condition for effective response and recovery when an emergency or disaster strikes. Without these capacities, any link from recovery to

development will not be sustainable. The mere act of developing and implementing a program for emergency preparedness will have significant secondary gains in encouraging local political commitment, community awareness and intersectoral cooperation. More specific activities within preparedness include:

- vulnerability assessment, and the dissemination of information related to particular hazards and emergencies;
- emergency planning;
- training and education;
- warning systems;
- specialized communication systems;
- information management systems;
- resource and information databases and management systems, and resource stocks; and,
- emergency exercises.

1.4 Some principles of emergency preparedness

Some principles derived from the above discussion are that emergency preparedness:

1. is the responsibility of all;
2. should be woven into the community and administrative context, and be undertaken at all administrative levels of both government and non-government organizations;
3. is an important aspect of all development policy and strategies;
4. should be based on vulnerability assessment;
5. is connected to other aspects of emergency management;
6. should concentrate on process and people rather than documentation;
7. should not be done in isolation;
8. should not concentrate only on disasters, but integrate prevention and response strategies for any scale of emergency.

Summary

- Emergency preparedness should be developed to suit the context of the community.
- Emergency management can be described by:
 - * the 'comprehensive' approach;
 - * the 'all hazards' approach;
 - * the 'multisectoral and intersectoral' approach; and,
 - * the 'prepared community'.
- Emergency preparedness is required at all levels within a nation, particularly at the community level.
- Community participation in emergency preparedness is essential for its success.
- Emergency preparedness concerns the ability to cope with the effects of emergencies, and consists of:
 - * legislation and policy;
 - * information on hazards, emergencies, and vulnerability;
 - * management systems;
 - * an aware and involved community;
 - * trained and organized personnel and organizations.

Chapter 2

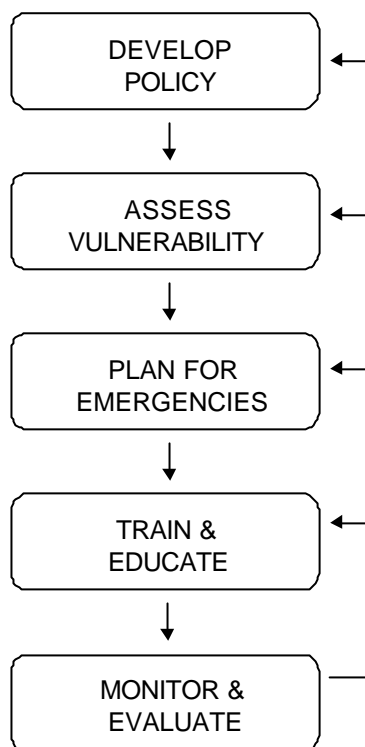
Managing emergency preparedness

This chapter outlines processes and tools for managing emergency preparedness at the national and sub-national levels, including an emergency preparedness process, some project management tools, and the national emergency profile.

2.1 An emergency preparedness process

An emergency preparedness process is a series of techniques for preparing a community, an organization, or an activity for emergencies.

Figure 2
An emergency preparedness process



Each part of process is outlined below, and will be further explained in the following chapters.

Policy development includes the development of emergency management legislation. Legislation is normally developed by a national government, and will mainly relate to responsibility for emergency preparedness and special emergency powers. There is also a need for central government, provincial and community organizations to develop subsequent policies. Similarly, non-government organizations that have emergency management responsibilities should develop appropriate policy.

Vulnerability assessment can be used to determine:

- which parts of a community are vulnerable to hazards and in what ways;
- which hazards may affect a community, and how they affect it;
- which aspects of the community should be modified to decrease vulnerability; and,
- which hazards should be considered for emergency prevention and preparedness.

A vulnerability assessment is also useful for response and recovery, as well as for prevention and preparedness, where it can be used to:

- suggest areas that may sustain damage, and assist in measuring harm to the affected

community;

- provide a baseline for recovery strategies, in that it will describe the 'normal' state of a community.

Emergency planning consists of determining:

- response and recovery strategies to be implemented during and after emergencies;
- responsibility for these strategies;
- the management structure required for an emergency; and,

- the resource and information management requirements.

Training and education concerns training personnel in emergency management skills and knowledge, and informing the community of the actions that may be required during emergencies and how the community can participate in emergency management.

Monitoring and evaluating are methods for determining how well the preparedness program is being developed and implemented, and what needs to be done to improve it.

Why use a process for emergency preparedness? We need to use a rational process for a number of reasons:

- firstly, if a rational process is not used, it is likely that some important aspects of preparedness will be missed; and,
- secondly, to explain to others what is being done, and how they can participate;
- thirdly, to justify the validity of the results it is necessary to demonstrate that a thorough analysis has been performed, and the use of a rational process is part of this justification.

This is particularly important when seeking funding for emergency management. This process should ideally be begun from the first step, and each step should be followed consecutively. Information from each step is used in subsequent steps.

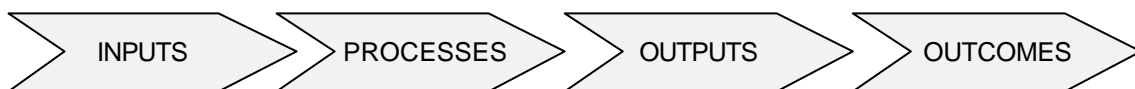
2.2 Project management

Whether developing and implementing an entire emergency preparedness program, or conducting a vulnerability assessment or emergency planning project, project management methods will be required. These methods are used to ensure that the project is:

- appropriate (it sets out to do something worthwhile);
- effective (it achieves the required results); and,
- efficient (it is completed within time and resource constraints).

Any project has a series of **inputs**, and **processes** that produce **outputs** which result in **outcomes**.

Figure 3
Parts of a project



The **inputs** include:

- people's time and energy;
- people's perceptions of vulnerability and emergency requirements;
- money and resources; and,
- commitment and perseverance.

The **processes**, in this instance, are the processes of emergency preparedness.

The **outputs** include:

- information on hazards and vulnerability;
- organizations that are aware of their responsibilities in preparing for, responding to and recovering from emergencies;

- commitment to an emergency plan; and,
- enhanced emergency preparedness.

The **outcomes** of appropriate and effective emergency preparedness are improved protection of life, property and the environment, and the ability to sustain development.

There are three major parts to project management:⁴

- project definition;
- project planning; and,
- project implementation.

Project definition is concerns the aim and objectives of a project, as well as its scope and authority. The project definition provides a brief outline of the intentions of the project to others, and provides a description of the project if funding is being sought. A project manager should be appointed to manage the project.

Project planning is the process of sequencing tasks to achieve the project objectives and to ensure timely project completion and efficient use of resources. It involves:

- determining tasks;
- assigning responsibilities;
- developing a timetable; and,
- determining resource allocation and timing.

Project implementation consists of project performance, monitoring and evaluation, and taking corrective action.

Using some simple project management tools and ideas, the professionalism and quality of emergency preparedness programs can be greatly increased.

2.3 National emergency profile

A national emergency profile is a summary of information relevant to hazards and emergencies in a country. This information is useful for:

- national, provincial, and district organizations - to provide them with current information on the hazards and communities, and the arrangements for managing emergencies;
- international organizations and donor countries - to assist them to target, in cooperation with national organizations, specific areas for development or assistance.

Table 1 contains the recommended content for a national emergency profile.

*Table 1
Recommended content for a national emergency profile⁵*

Section	Content
Introduction	<ul style="list-style-type: none"> • executive summary • recommendations for enhanced emergency preparedness • recommendations for development projects
Hazards and vulnerability	<ul style="list-style-type: none"> • emergency history • description of hazards and communities • vulnerability to emergencies (geographical areas, parts of the community, sections of the economy, etc.) • some possible emergency scenarios
Emergency preparedness	<ul style="list-style-type: none"> • legislation and policy • intersectoral emergency management structures • emergency responsibilities of national and provincial organizations • emergency management capacity of the Ministry of Health • current vulnerability assessment, emergency planning, training, education and evaluation programs • alerting and warning systems
Emergency response	<ul style="list-style-type: none"> • expected external requirements for possible emergency scenarios • contact list for emergency organizations • local suppliers of health relief items • customs regulations for import of relief items
Emergency recovery	<ul style="list-style-type: none"> • national development policy regarding emergency recovery

The methods for gathering and analyzing the information required for a national emergency profile is described in the following chapters of these guidelines.

Summary

- An emergency preparedness process consists of a series of logical steps, including:
 - * policy development;
 - * vulnerability assessment;
 - * emergency planning;
 - * training and education; and,
 - * monitoring and evaluation.
- Emergency management processes can be used for any community, organization or activity.
- Emergency preparedness programs should use standard management techniques.
- A national emergency profile is a valuable tool for national, provincial and community organizations, and for international organizations and donor countries
- The national emergency profile should explicitly connect emergency preparedness to national sustainable development policies.

Chapter 3

Policy development

This chapter outlines the nature of policy, the need for emergency preparedness policy, and some emergency preparedness policy areas.

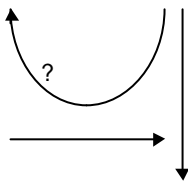
3.1 The nature of policy

Policy can be defined as ‘the formal statement of an agreed course of action’. Policy:

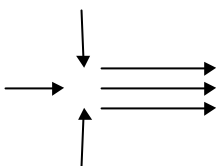
- is strategic in nature;
- concerns the establishment of long-term goals;
- assigns responsibilities for achieving goals;
- may establish recommended practices; and,
- may determine criteria for decision-making.

Policy is required to ensure that common goals are pursued within and across organizations and activities, to make actions legal, to protect people from liability, and to ensure that common practices are followed. Without agreed policies there will be poor coordination, a lack of a unified direction, and poor results.

Directions in a policy-free environment



Directions with appropriate policy



Policy can take the form of legislation, decisions by executive government, interorganizational agreements, or organizational directions. The choice of the form of the policy depends upon the scope of the policy and the degree of authority required. Policy of national significance should be in the form of legislation or decision by executive government. Where two or more organizations need to cooperate together then an interorganizational agreement may suffice. Organizational direction is at the discretion of a single organization.

Policy development is usually ‘top-down’ in that a central authority will prepare policy. Whilst policies tend to be top-down, implementation of strategies that arise from a policy tend to be bottom-up, with higher levels assisting lower levels.

Policy should be developed with the participation of those who are required to implement the policy. This will ensure that a policy is realistic and achievable, and will win the commitment of those responsible for implementing the policy. As with any other management process, policy development and implementation should be monitored and evaluated, and specific responsibility for this should be allocated.

Policy in emergency preparedness should take account of:⁶

- the rights of individuals;
- public attitudes and cultures;
- the nature of the hazards and the communities;
- existing policies relating to development, health and the environment;
- existing legislative and organizational responsibilities; and,

- accepted emergency management concepts.

3.2 Emergency preparedness policy areas

Policies may be required to determine:

- the objectives of emergency preparedness;
- the connection between development and prevention, preparedness, response and recovery;
- how risk and vulnerability can be used as decision-making criteria in development, resource management, land use planning, and environmental management
- the authority and roles of each level of government, and of non-government organizations;
- encourage non-government organization and private enterprise participation;
- the relations with international organizations, and other nations;
- the relations between communities;
- management structures, including intersectoral and intrasectoral cooperation, emergency planning committees and membership, and national, provincial, district and community participation;
- resource allocation for prevention, preparedness, response and recovery;
- how an emergency is declared, by whom, and why;
- emergency powers concerning evacuation and resource acquisition, and limitations on emergency powers, including non-application to civil strife and military action;
- protection of emergency workers from liability when acting in good faith during emergencies;
- the means for funding prevention, preparedness, response and recovery;
- the requirement to develop response and recovery plans
- the requirement for training and education, and monitoring and evaluation, including emergency exercises.

Summary

- Policy can be defined as ‘the formal statement of an agreed course of action’:
- Emergency preparedness policy areas relate to:
 - * objectives of emergency preparedness;
 - * connection to sustainable development;
 - * roles of organizations;
 - * management structures;
 - * resource allocation;
 - * emergency powers;
 - * content of emergency preparedness programs.

Chapter 4

Vulnerability assessment

This chapter outlines processes and tools for analyzing hazards, communities, and the environment. This information is necessary for the development of appropriate and effective emergency preparedness programs.

4.1 Introduction

Vulnerability assessment (otherwise known as ‘hazard analysis’, ‘threat assessment’, ‘risk assessment’) is a method for identifying hazards and vulnerability, and for determining their possible effects on a community, activity, organization or the environment. The information provided by vulnerability assessment is essential for:

- **sustainable development** - which will be at risk without programs and strategies to reduce vulnerability;
- **emergency prevention** and **preparedness** - if you don't know what is likely to go wrong, and what the effects will be, you can't be effectively prepared;
- **emergency response** - many emergencies cause major disruption to transport and communications - under these conditions where information is either unreliable or non-existent, vulnerability assessment will suggest where the damage may occur;
- **emergency recovery** - vulnerability assessment can provide a ‘baseline’ against which to compare the effectiveness of recovery work, by describing the prior condition of the community.

There are a number of possible ways of assessing vulnerability. The process for vulnerability assessment described here is a series of steps each of which contains a number of techniques. For example, hazard identification, community and environmental analysis, and hazard description are some of the steps. In turn, there are a number of techniques for identifying hazards, for describing the people, property and environment that they may affect, and for describing hazards.

What is ‘vulnerability’ and ‘hazard’?

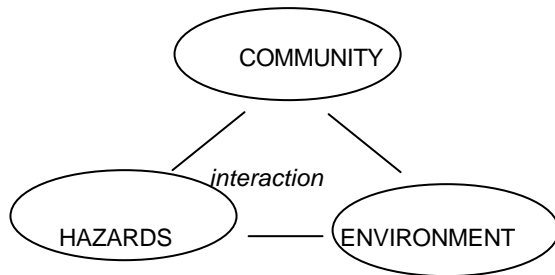
Vulnerability is the result of a number of factors that increase the chances of a community being unable to cope with an emergency. Not all sections of a community are vulnerable to hazards, but most are vulnerable to some degree. Vulnerability consists of two aspects - susceptibility and resilience. **Susceptibility** concerns the factors of a community which allow a hazard to cause an emergency, e.g. living in an earthquake-prone area or the level of development of the community. **Resilience** is the ability of a community to withstand the damage caused by emergencies, includes all the factors that allow a community to respond to and recover from emergencies.

In the context of emergency management, **hazard** can be defined as any phenomenon which has the potential to cause disruption or damage to humans and their environment

Communities, Environments & Hazards

A community has a very close relationship with its environment and hazards. An example of the way in which a community interacts with its environment and hazards is when people

Figure 4
Links between community, hazards and environment



move into a hilly, forested area and clear land for agriculture. Forests and many other natural ecosystems retain rainwater, some of which then evaporates or is slowly released. Of course there is still the potential for flood, but it is only the very heavy rain events that will cause serious flooding. When a forested area is cleared, the water drainage changes. There is less vegetation and humus to retain water, and so the water runoff is greater. There is also a greater amount of erosion, causing increased river siltation. So when heavy rainfall occurs, there is a greater likelihood of serious flooding which may lead to further changes in the drainage system.

Given that communities tend to live on or near flood plains, and that settlement patterns may only have taken into account the flood characteristics that existed prior to forest clearing, there may be some problems including:

- severe floods leading to loss of life and the destruction of buildings, bridges, roads, dams and livestock;
- increased risk of disease due to contaminated water supplies, lack of food and exposure;
- removal of valuable topsoil from agricultural areas and hence decreasing productivity; and,
- river siltation reducing the navigability of the rivers.

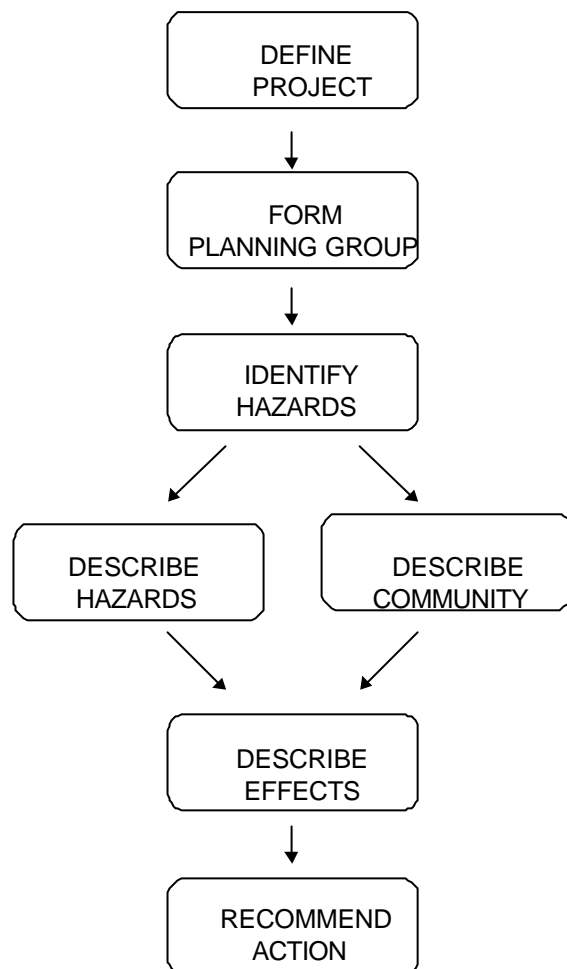
Thus, a community can cause changes in the environment, which in turn will alter the hazards. The changed hazards may in turn alter the environment, the community and its vulnerability. It is therefore essential to examine how the community, environment and hazards interact when performing vulnerability assessment.

4.2 A vulnerability assessment process

The parts of this vulnerability assessment process are as follows, and are further explained later in this chapter.

Project definition is about determining the aim, objectives and scope of the vulnerability assessment, determining the tasks to be performed and the resources needed to perform them.

Figure 5
A vulnerability assessment process



results of the vulnerability assessment.

Documentation of all results and decisions is necessary to justify the recommendations, and any further emergency preparedness work.

The formation of a representative **planning group** is essential to both vulnerability assessment and emergency planning. Without such a group it will be difficult, if not impossible, to gather the required information, gain the commitment of key players and allow the community to participate.

Hazard identification concerns discovering the hazards that may affect the community or environment.

Hazard description involves describing the hazards in the community. The same hazards do not manifest themselves in precisely the same way in different areas, and in different communities, because there is an interaction between hazards, the community and the environment.

Community and environment description is the relevant information about the people, property or environment that may be affected by the hazards identified, or that may affect identified hazards. At this point more hazards may be identified.

A description of **effects** is an account of what is likely to happen in an emergency or disaster involving a single hazard or multiple hazards.

Recommendations for action are the link between vulnerability assessment and other emergency management activities. Planning, training and education, and monitoring and evaluation should be based firmly on the

4.3 The planning group

Having developed a project definition, forming a planning group is the second step in the vulnerability assessment process. Why is a planning group essential to the development of appropriate vulnerability assessments and emergency plans?

- Firstly, rapid access is required to diverse information. It is possible to gather this information through correspondence, interviews, and telephone calls, but this method will take time. Assembling the people who can provide information will make information gathering more efficient.
- Secondly, no single person is expert in everything and so the input of subject experts is required. If local subject experts are ignored they may become the greatest critics of your vulnerability assessment and emergency preparedness program.
- Lastly, if the vulnerability assessment is to be taken seriously, then the commitment of all the relevant players is required. An effective means of gaining this commitment is through allowing people to contribute to the aim and objectives of the vulnerability assessment, and working together to produce the end result.

How is a planning group selected? Firstly, see if one already exists! There may well be a group of people who are responsible for safety, crisis or emergency management in a given organization or community. If such a group exists, then it may be ideal for the purposes of preparing a vulnerability assessment because it may already have:

- the appropriate authority;
- appropriate representation;
- an efficient reporting system;
- sufficient expertise.

If a planning group does not exist, then it should be constituted using the above four criteria, as well as referring to the project definition.

4.4 Hazard identification

Hazard identification concerns discovering the hazards that may affect the community. Hazard identification is not straightforward - people may have quite different perceptions on what constitutes a significant hazard. It is therefore important to seek the views of many people from the community.

Techniques for identifying hazards include:

- researching the history of emergencies in the community, by consulting histories, newspapers, records and older community members;
- inspecting the community for evidence of previous emergencies, existing hazards and existing vulnerability;
- examining literature or interviewing people from other similar communities;
- requesting information from provincial or national governments;
- using maps to overlay known community and environmental characteristics and determining potentially harmful events; and,
- using the planning group to 'brainstorm' on possible hazards.

4.5 Hazard description

There are five basic characteristics that can be used to describe most hazards:

- intensity (how big, fast, powerful);
- frequency (the likelihood of a hazard causing an emergency);
- extent (the area that a hazard may affect);
- time-frame (warning time, duration, time of day/week/ year);
- manageability (what can be done about it).

For each hazard these characteristics may mean quite different things. For example, in a cyclone, intensity might relate to wind speed, whereas in an earthquake intensity means the number and strength of earth tremors. Each hazard should be described using these characteristics.

Hazard mapping

One of the best ways of presenting the results of vulnerability assessment is through maps. Maps provide a familiar spatial dimension, and the characteristics of a given hazard can be overlaid on other types of information, such as features of the environment, and relevant characteristics of a community. Hazard maps show the geographical area potentially affected by a hazard. In themselves, these maps are very good tools for development planning and for emergency preparedness. By themselves, however, they do not show the whole picture. When combined with maps showing the community and environment, a much more complete idea of the problems and opportunities posed by hazards and development can be achieved.

4.6 Describing the community

The purpose of vulnerability assessment is to describe the interaction between hazards, the community and the environment in order to develop programs and strategies for protecting the community and the environment. Just analyzing and describing hazards can be a fascinating study in its own right, but knowledge of the community is required in order to produce results that save life and property and protect the environment. Without knowledge about the community and environment, it is impossible to describe their vulnerability, and thus develop appropriate strategies. The characteristics shown in Table 2 can be used to describe a community. Each column in this table is discussed below. For the sake of this vulnerability process, the environment is considered a part of the community.

Table 2
Some community characteristics

Demography	Culture	Economy	Infrastructure	Environment
population & age distribution	traditions	trade	communication & transportation networks	land forms
mobility	ethnicity	agriculture/ livestock	essential services	geology
useful skills	social values	investments	community assets	waterways
hazard awareness	religion	industries	government structures	climate
vulnerable groups	attitudes to hazards	wealth	resource base	flora & fauna
health status	normal food types			
education level				

Demography

Demography is the study of human populations. There is often a large amount of data available on the population of any given community, but only some of this data is relevant to emergency preparedness. The relevant data concerns the number of people in the area of study, their distribution across the area, the distribution of population characteristics, and any concentrations of vulnerable groups. Such groups may be vulnerable due to age (either the young or the aged), their mobility (whether or not they have adequate transport available to them) or due to disabilities. But most people are vulnerable to emergencies in some way, not just these easily defined groups.

Important indicators specific to health emergency preparedness are:⁷

- health indicators which determine how much resistance people can offer to the health effects of an emergency, e.g. -
 - * **infant mortality rate** and **life expectancy** which indicate the coverage of health services,
 - * **vaccination coverage rate** indicates the extent and effectiveness of preventative programs,
 - * **disease pattern** indicates potential outbreaks or exacerbation after an emergency,
 - * **malnutrition rate** indicates how quickly and for how long feeding programs may be needed;
- educational indicators which determine how sophisticated the role of the community can be in participating in response activities and the level and type of public message that can be used, e.g. -
 - * **literacy rate** which is important for assessing the level of community participation and response that can be planned for,
 - * **female literacy rate** which is important for the success of health education and public preparedness.

The best way to access demographic data for a community is to contact the government organization responsible. The data may be available either in book or computer file form.

Culture

The attitudes of a community towards hazards and vulnerability will be strongly influenced by their attitudes towards nature, technology, the causation of accidents and emergencies, and the value of mitigating or contingent actions. Some communities, for example, accept that lives will be lost due to emergencies, and may be unwilling to take preventative, preparatory or response actions.

Economy

The economy is a part of the community that requires protection. Consider the implications of a major disaster on investments and tourism. It is likely that an emergency that causes considerable structural and environmental damage would devastate the local tourism industry. Investment may also suffer, due to a perception on the part of potential or current investors that the risks in the area are too high. Industries and trade could also suffer due to a restriction in the access to both goods and markets caused by disruption to transport and communications. The wealth of a community may also determine its ability to sustain harm, or resilience.

Infrastructure

The infrastructure (both physical and organizational) of a community is often highly vulnerable to hazards, particularly natural emergencies. A vulnerability assessment should consider any possible damage to power generation and distribution systems, water supplies, communications systems, etc. These are often referred to as 'lifelines', and factors relevant to them are:

- the existence of risk management systems;
- the effects of loss of the service on the community;
- the possible extent of damage;
- alternative means of supplying the service;
- the amount of time repairs would take; and,
- the cost of repairs.

Of particular relevance to the health sector is the hospital system. It is also important to have a basic description of the government structure, and service and community organizations, as these will provide the mechanism for emergency management programs and strategies.

Environment

The environment can be defined as the natural surroundings, and includes plants and animals, water, air and soil. If any of these elements of the environment are damaged, other elements might also be affected, due to the inter-connectedness of all parts of the environment.

We need to protect our environment to ensure a viable future for us all. Many hazards can adversely affect the environment, including chronic (that is continuous and low level) or acute (sudden and high level) pollution by hazardous materials. The environment also determines the settlement patterns and lifestyles of communities.

Paradoxically, the environment that nurtures us also causes some of the biggest threats - natural hazards. Indeed, describing the environment in a vulnerability assessment will often identify some hazards that haven't yet been considered.

Community & environment mapping

Detailed information on a community can be effectively documented using maps. This is particularly so when the characteristics that describe the community vary systematically over a geographical area. Some of the information concerning a community that can be mapped includes:

- population density;
- vulnerable groups - prisons, mental hospitals, orphanages, homes for the handicapped, spontaneous settlements;
- potential emergency shelter sites;
- community preparedness focal points;
- emergency services - police, fire, ambulance, civil defense, military;
- residences of essential staff;
- proposed food distribution points;
- water and sanitation information;
- health centers;
- warehouses;
- lifelines;

- communication networks;
- essential businesses and factories;
- fuel storage points and distribution sources;
- transport systems and networks;
- road exit points from district; and,
- ongoing routine maintenance of roads and utilities.

Such maps are of great value for preparedness, response and recovery.

4.7 Effects & vulnerability description

The way that the effects of hazards and vulnerability are described will depend on the scope of the vulnerability assessment. If the scope is a community, then a standard set of parameters to describe the effects (for example, extent and number of services disrupted, number of homeless persons) can be used. If the scope is a hospital, other parameters (for example, effect of loss of service on the community, emergency medical demands on the hospital, effects on staff, cost of and time required for repairs) would be of value. Table 3 shows some possible parameters for describing the effects of hazards on a community, and community vulnerability. These possible parameters should be discussed with your planning group and they should be modified if necessary.

*Table 3
Descriptive parameters for the potential effects of hazards⁸*

Effects	Measure	Losses	
		Tangible	Intangible
Deaths	Number of people	Loss of economically active individuals, cost of retrieval & burial	Social & psychological effects on remaining community
Injuries & disease	Number, injury severity, disease type, disease severity	Medical treatment, temporary loss of economic activity by individuals, reduced ability of medical facilities in dealing with normal cases	Social & psychological pain & recovery
Food shortage	Nutrition status and food availability	Temporary loss of economic activity by individuals	Social & psychological effects
Social disruption	Number of displaced & homeless persons	Temporary housing, recovery work, economic production	Psychological, social contacts, cohesion, community morale
Disruption of services & infrastructure damage	Services disrupted, location, degree of damage, down-time	Inconvenience & harm to service users, replacement & repair costs	Concern over loss of services
Private property damage	Property type, degree of damage & location	Replacement & repair cost	Cultural losses, decreased self-sufficiency
Disruption to economy	Number of working days lost, volume of production lost, amount of trade lost	Value of lost production	Opportunities, competitiveness, reputation, increased vulnerability

Environmental damage	Scale & severity	Clean-up costs, repair cost	Consequences of poorer environment, risk of future emergency, increased vulnerability
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Effects & vulnerability mapping

Vulnerability maps show the interaction between the community, environment and hazards. This allows an estimation of the degree of harm or loss that may occur. One way to produce these maps is as transparent, removable overlays on a base map.

Even if vulnerability maps are beyond the time and money resources of a preparedness program, the concept of mapping can still be used as an analogy. In determining the likely effects of hazards it is worthwhile to consider how the community is spatially related to the hazard.

Geographic information systems (GIS)

Geographic information systems (GIS) are increasingly being used for hazard and vulnerability mapping. A GIS is essentially a computer program that combines a relational database with spatial interpretation and output. A more technical definition is a system for capturing, storing, checking, integrating, analyzing and displaying data about the Earth that is spatially referenced.⁹

It is possible to enter a variety of types of data, and relate them through formulae, or overlap them in a graphic presentation, either on screen or as a printed map. GIS is increasingly becoming a tool for the everyday administration of communities, and existing systems and information can be used for emergency management purposes.

GIS allows the rapid analysis of large quantities of related data, and can also be used as a predictive tool. When applied to hazard and vulnerability information, GIS can be used for all aspects of emergency management.

Emergency scenario building

Developing emergency scenarios is about defining a limited set of possible emergencies, and determining what the effects of the emergencies may be. This is particularly useful for emergency planning, because it will provide the planning with some very specific objectives. Given the information derived from hazard identification, hazard description, and community and environment description, it is now possible to develop emergency scenarios.

Figure 6
Risk matrix

probability	high	L	M	M	H	H
		L	L	M	M	H
		L	L	L	M	M
		I	L	L	L	M
	low	I	I	L	L	L
		low				high
		consequence				

H = high risk, M = medium risk, L = low risk,
I = insignificant risk

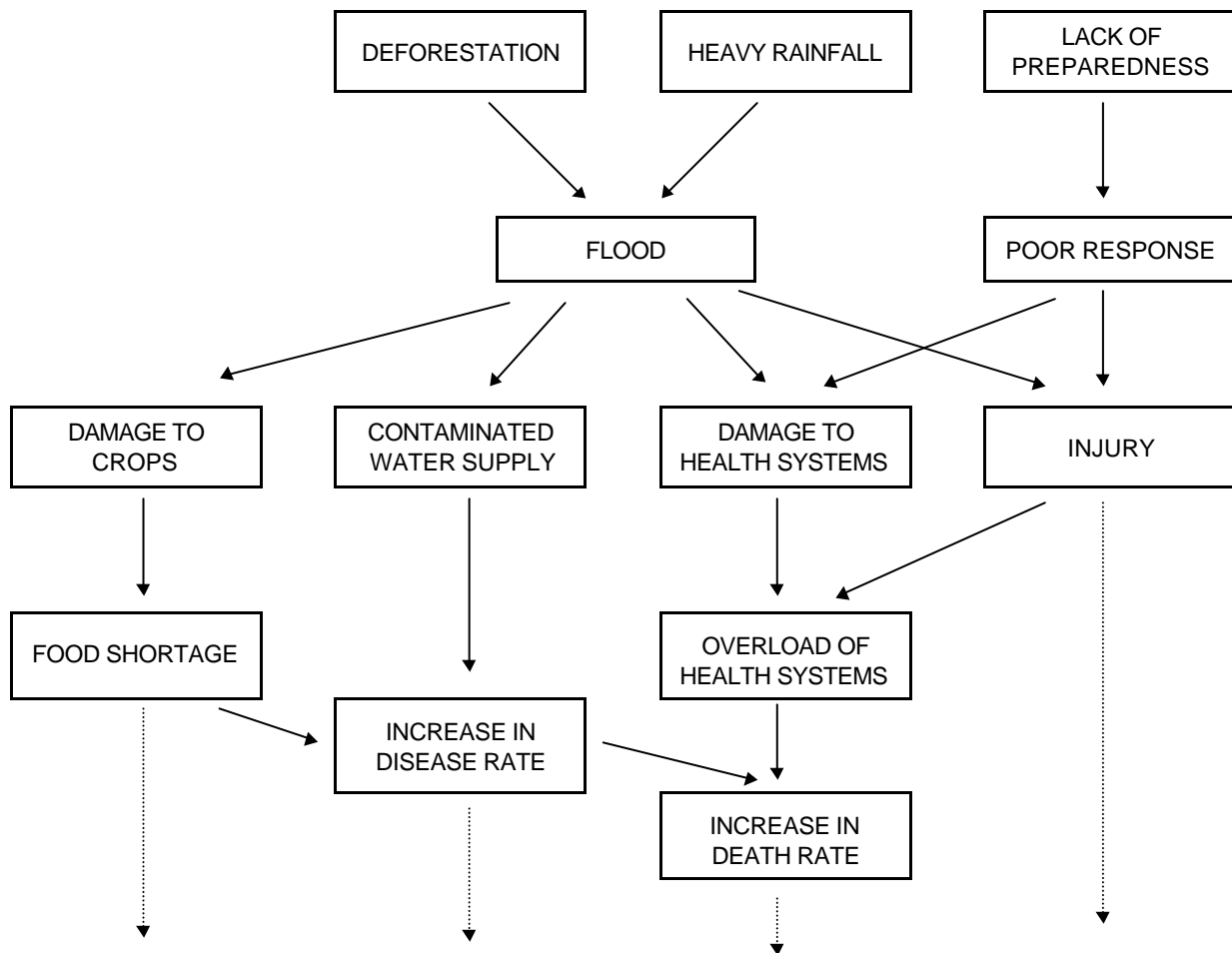
Firstly, it is necessary to determine the probability and consequence parameters for the emergency scenarios. At one extreme, it is pointless developing emergency scenarios that are highly improbable, such as a severe earthquake occurring at the same time as a tropical cyclone, or a flood with a 1 in 100,000 year recurrence interval (i.e. with a 0.001% chance of occurring in any given year). At the other extreme, emergency scenarios that are expected but have low consequences, such as a single-vehicle road accidents, are usually not considered emergencies. So the types of emergency scenario that should be chosen are those that are both:

- high to medium probability; and,
- high to medium consequence;

that is, high or medium risk (see Figure 6). In fact, two or three emergency scenarios of different degrees of risk per hazard could be considered.

Second, the planning group should also not forget that an emergency might cause other emergencies. There is usually, in fact, a cascade effect of causes and emergencies causing more and different emergencies. These should be relatively predictable, and should also be planned for. So a dynamic unfolding emergency scenario, could cover causes and emergencies similar to the flood example in Figure 7 below.

Figure 7
Cascading causes and emergencies



Third, consider the geographic distribution of each hazard separately, and describe the interaction of the hazard with the environment and community, using the descriptive parameters from Table 3 above (i.e. deaths, injuries, etc.). Different types of losses, such as tangible and intangible, direct and indirect, need to be considered.

To follow the flood example, the emergency scenarios chosen for flood could be the 1:5, 1:10 and 1:100 year floods (0.2%, 0.1%, and 0.01% probability floods) for a given area. Table 4 shows how emergency scenarios might be described for these floods.

Table 4
Example flood emergency scenarios

Effects	1:5 year flood	1:10 year flood	1:100 year flood
Deaths	0	0-5 people	10-100 people
Injuries and disease	0 injuries, some people with diarrheal diseases	25-50 minor injuries, 5-10 major injuries, some people with diarrheal diseases	200-300 minor injuries, 5-10 major injuries, widespread disease
Food shortage	short-term inconvenience, with minimal food supply damage	considerable inconvenience, with significant food supply damage	nutritional emergency with serious, long-term food shortage expected
Social disruption	100 families requiring temporary, short-term accommodation, minimal mental distress	1000 families requiring temporary, short-term accommodation, 150 requiring permanent relocation	10,000 families requiring temporary, short-term accommodation, 1,000 requiring permanent relocation, widespread distress
Disruption of services & infrastructure damage	some roads destroyed	many roads & bridges destroyed, loss of water supply	communities totally isolated for weeks, most lifelines severely & permanently damaged
Private property damage	no homes destroyed, minimal home content loss	150 homes destroyed, considerable loss of home contents, tools & livestock	over 1,000 homes destroyed, total loss of home content
Disruption to economy	minimal	some small businesses become bankrupt, minor downturn in income for community	long-term disruption requiring national assistance programs
Environmental damage	some minor damage to riverbed & flood plain	some minor damage to riverbed & flood plain	massive alteration of flood plain, weed infestation,

The information in the above, fictitious example will provide a firm basis for emergency preparedness.

4.8 Recommending action

There are three things that need to be produced at the end of the vulnerability assessment:

- a summary;
- conclusions; and,
- recommendations

The **summary** is a very brief synopsis of the entire work, containing the method, planning group composition, very brief conclusions, and list of the recommendations.

Conclusions are a logical extension of previous work, thus they are focused on work performed and something that already exists. Conclusions are statements deduced from the information in the vulnerability assessment. They should not introduce any new facts, but be based solely on previous work.

Recommendations are focused on the future, in that they suggest what future work needs to be done in emergency preparedness, response and recovery.

There are three important questions that the planning group must consider when writing the conclusions and recommendations.

1. To whom is the planning group to report the conclusions and recommendations of the vulnerability assessment? - Reporting will normally be to the individual or organization that granted the authority to perform the vulnerability assessment.
2. What should the conclusions and recommendations look like? - The conclusions should be a series of short statements of fact, and interpretation of facts. The proof, justification and argument for these conclusions should all be in the body of the vulnerability assessment. If necessary, specific sections of the vulnerability assessment should be referred to justify the conclusions. The recommendations are based on the conclusions and are the link to the rest of the emergency preparedness process.
3. How does the planning group gain support for the conclusions and recommendations? - In order to achieve support from the individual or organization being reported to:
 - a copy of the vulnerability assessment should be provided; and,
 - a verbal presentation of the summary of the vulnerability assessment should be made.

Summary

- Vulnerability assessment is a method for identifying hazards, describing community vulnerability, and determining the effects of potential emergencies on communities.
- Communities, hazards and the environment interact with each other.
- A vulnerability assessment should be developed using a rational process.
- A planning group, and community participation, is essential to the efficient development of an appropriate vulnerability assessment.
- A description of the effects of hazards and potential emergencies on communities must form the basis of emergency preparedness.
- Action must be recommended to the highest possible authority.

Chapter 5

Emergency planning

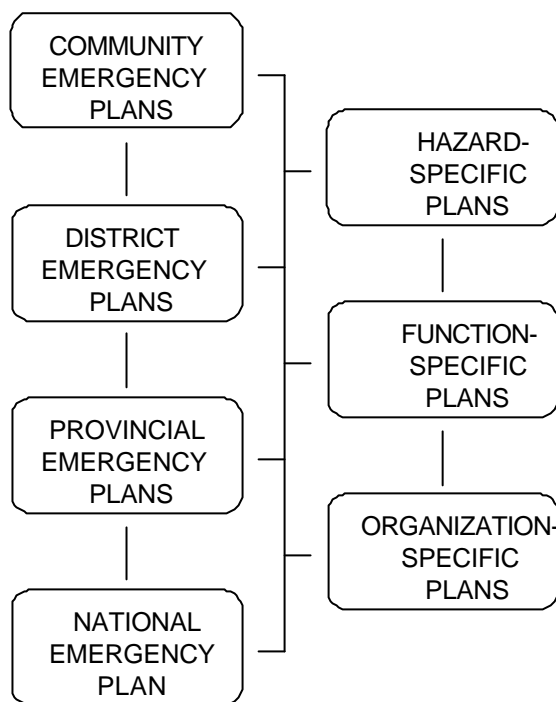
This chapter outlines the context of emergency planning, processes and tools for emergency planning, and strategies and systems that emergency planning might produce.

5.1 Introduction

An emergency plan is an agreed set of arrangements for responding to, and recovering from emergencies, involving the description of responsibilities, management structures, strategies and resource and information management. Emergency planning is about protecting life, property and the environment.

Figure 8

Context of emergency plans



When developing an emergency plan there will be other related plans that will influence it. There is a need to consider the plans at other administrative levels, those plans that operate at the same level, as well as any plans developed for specific hazards (e.g. flood plans), functions (e.g. mass casualty management) or by other organizations (e.g. Ministry for the Environment). Figure 8 illustrates this.

The prerequisites for planning are:

- a recognition that hazards and vulnerability exist, and that emergencies can occur;
- an awareness by the community, government, and decision-makers of the need to plan and of the benefits of planning;
- implementation of the plan is guaranteed by appropriate legislation;
- designation of an organization responsible for coordinating both planning and emergency response and recovery in the event of an emergency.

The planning process will produce:

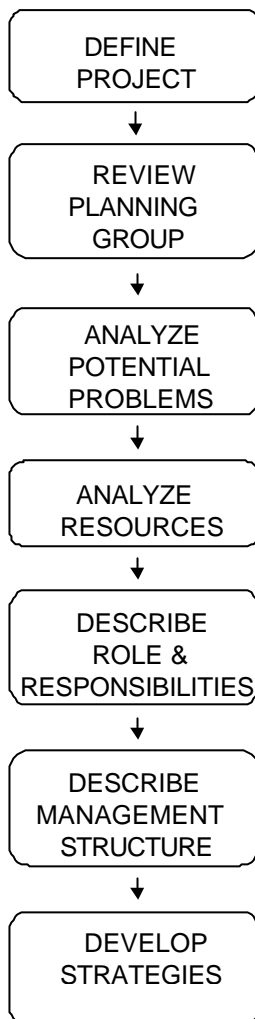
- an understanding of organizational responsibilities in response and recovery;
- strengthening of emergency management networks;
- improved community participation and awareness;
- effective response and recovery strategies and systems;
- a simple and flexible written plan.

The written plan itself is only one outcome of the planning process.

5.2 An emergency planning process

The planning process is a series of steps to produce an emergency plan. This process can be applied to any community, organization or activity, e.g. for the health sector in general, hospitals, search and rescue organizations, etc. It is primarily intended for preparedness, but can be used for planning **during** response and recovery operations. Each step of the planning process is defined briefly in this section, and is further described throughout this chapter.

Figure 9
An emergency planning process



- **Project definition** determines the aim, objectives and scope of an emergency plan, and decides the tasks required, and the resources required to perform these tasks. The emergency scenarios and recommendations from the vulnerability assessment should be used to develop planning objectives.
- The formation of a representative **planning group** is essential to emergency planning. Without such a group it will be difficult, if not impossible, to gather the required information and to gain the commitment of key people and organizations. There may be a need to review any existing planning group to assess its appropriateness.
- **Potential problem analysis** further examines hazards, their causes, possible preventative strategies, response and recovery strategies, and trigger events for these strategies. It will provide information for later steps of the process.
- The **resource analysis** asks: what resources are required for the response and recovery strategies, what is available, what is the variation between requirement and availability, and who is responsible for the resources?
- A description of **roles and responsibilities** outlines who does what.
- The **management structure** concerns the command of individual organizations and control across organizations.
- Developing **strategies and systems** concerns specific response and recovery strategies, and the systems that will support these strategies.
- Each step of this process must be **documented**. The written emergency plan will consist of the outputs of each step of the process.

5.3 Planning group review

A planning group is essential to the development of appropriate emergency plans, because those who will implement the plans must participate in developing the plans. Some criteria for selecting members of a planning group are as follows. Is this person: aware of the emergency management roles of their organization? actively involved in either preparedness, response or recovery? of sufficient seniority to commit their organization to planning group decisions? capable of contributing to the planning group's work?

The planning group should be small enough to be functional, and will generally only include one representative from each organization. The appropriateness of an existing planning group can be assessed in the same way. The planning group should be briefed on the results of the vulnerability assessment, consider the recommendations of this assessment, and begin planning.

5.4 Potential problem analysis

Potential problem analysis¹⁰ is a technique for identifying preventative strategies, and response and recovery strategies for problems that may arise in a given situation. Its value is that it systematically breaks any problem down into its components, aims to prevent the actual cause(s) of the problem, rather than just symptoms, develops response and recovery strategies, and can lead to innovative and effective strategies. The technique involves:

- listing of hazards and emergency situations (from emergency scenarios);
- listing potential problems (from emergency scenarios);
- determining causes;
- developing preventative strategies;
- developing response and recovery strategies, and trigger events for these strategies.

Preventative strategies are the means by which the probability of the problem occurring can be reduced, whilst response and recovery strategies are the means by which the seriousness of a problem, if it does occur, can be reduced.

At least two things are required to initiate a **response** or **recovery strategy**: a trigger event and a person or organization responsible for initiating the strategy. The trigger event should indicate when the strategy is required, and could be an alarm, warning or the emergency itself. The responsible person/organization should be capable of initiating the strategy and the responsibility should be predetermined.

For instance, in a very simple example: when flood water [hazard] reaches the two meter level at the bridge [trigger], a landowner [responsible person] contacts three neighbors so that they might move their livestock to high ground [response strategy].

The strategies developed here have to be assessed for resource availability. If the required resources are not available, alternative resource supplies, or alternative strategies, will be required.

5.5 Resource analysis

Given that the potential problem analysis has suggested some response and recovery strategies, it is necessary to determine what resources can be applied.

A 'resource', as the term is used here, is anything of value or use in emergency management. This includes people, training, equipment, facilities, materials, and money. The relevant questions to ask are:

1. what are the possible or proposed strategies?
2. what resources are required?
3. what resources are available?
4. who is responsible for this resource?
5. what is the difference between the requirements and availability?
6. if there is a shortfall, who is responsible for correcting it?

The potential problem analysis will have suggested some strategies, and these should be listed along with resources required to support them.

When some required resources have been listed, **available resources** should be identified. The expertise and knowledge of the planning group are invaluable in determining what is available.

The third part of the resource analysis is to determine the **difference** between what is required and what is available. If the resource is available or in place, then responsibility for

providing this resource should be noted. If the resource is not available, then some further questions should be asked, including:

- who should be responsible for providing this resource?
- will it have a significant effect on the hazard or vulnerability?
- will it be cost-effective?

If resources are available that are not required, then the following questions may be asked:

- has the resource requirement been poorly described?
- is time and money being spent on resources that are not required?
- how can the time and money be used better?

For instance it may be worthwhile to discuss the benefit of possible additional resources and weigh this with the cost of the resources; resource-sharing with other organizations or areas may be considered; if a decision is made to acquire additional resources, the decision will need to be justified in a rational way; similarly, if a decision is made to shed apparently unnecessary resources, this will have to be justified.

A resource analysis will also be of great assistance when requesting external assistance, either from within a country, or from outside.

5.6 Roles & responsibilities

Roles and responsibilities must be defined and described to ensure that each organization knows precisely what is expected of it, and to ensure that all people are aware of the general roles of all relevant organizations. The definition of roles and responsibilities may also assist in defusing rivalry between organizations that are competing for the same task or group of tasks, and will ensure that all tasks are allocated.

The questions relevant to the definition and description of roles and responsibilities are:

- Where do we get the information to adequately define and describe roles and responsibilities?
- Have we described who performs each task that is required?
- Have we described the roles and responsibilities of each organization?
- Do members of each organization know the specific tasks that must be performed by their organization?
- Do members of each organization know the general role of other organizations?
- Who is the primary (or lead) organization for a given type of emergency, and who are the secondary (or support) organizations?

Information for roles and responsibilities

For government organizations, the first place to look for information on roles and responsibilities is legislation that describes their general functions and powers. These functions and powers are usually applicable to normal day-to-day life, but are also important in emergency management, e.g. one of the major functions of the police is to maintain law and order, and they will perform this task every day **and** during emergencies. Government health organizations are normally involved in ensuring the health and well being of the public, and will perform the same function during and after emergencies.

There also may be provision in legislation for special organizational functions in emergency management.

For non-government organizations, there is often a legislative or legal requirement to perform certain tasks. For example, industry has a duty of care responsibility to its neighbors, in that any potentially harmful material in their control or on their property must be handled with a reasonable degree of care to ensure that its escape does not lead to harm to their neighbors. Such potentially harmful material covers a range of possibilities, from large quantities of stored water in dams to small amounts of hazardous materials.

Beyond legislation, there are likely to be inter-organization policies and agreements that affect the functions of organizations in emergency management. The resource analysis also assigned responsibilities to certain organizations for the provision of certain resources. Being based on a vulnerability assessment and potential problem analysis, resource analysis will have determined many of the tasks required in response and recovery.

There are two suggested ways of describing roles and responsibilities: one is to describe the roles and responsibilities by task; the other is to describe them by organization.

Describing roles & responsibilities

The description of roles and responsibilities **by task** is of value to:

- those who want a quick overview of who is supposed to do what; and,
- those who are responsible for controlling or coordinating emergency management activities.

The description is based on a list of tasks with the organizations assigned to each of the tasks. The list of tasks could be organized alphabetically, or by the aspect of emergency management to which they pertain, i.e. response or recovery,

The description of roles and responsibilities **by organization** requires each organization to be listed, and the roles of each organization described. This is useful for members of a given organization as they can see at a glance what their organization has undertaken to do.

Assessing organizations

Given that organizations have agreed to perform tasks, it is often necessary to assess their suitability and effectiveness for emergency response.¹¹ Such an assessment should be undertaken with the active participation of all relevant organizations through the planning group. Aspects of the assessment may include: **capability**; **availability**; **durability**; and **operational** integrity.

- **Capability** refers to whether an organization has the resources to carry out its assigned tasks. Obviously the emergency management tasks allocated to an organization should be very similar if not identical to the tasks carried out by that organization under normal conditions. However, most organizations are rarely required to carry out these tasks during an emergency. There should therefore be an assessment of the ability of an organization to operate under emergency conditions.
- **Availability** refers to the speed with which an organization can apply resources in an emergency. Delays may occur due to the call-out of staff, the switching from normal activities to emergency operations, and the need to continue to carry out normal activities. Hospitals, for example, still need to care for normal patients, and may thus become quickly overwhelmed by an influx of new patients.
- **Durability** refers to the ability of an organization to sustain emergency operations. The size and resource base of an organization will partially determine its ability to maintain operations for many days or even weeks, 24-hours a day. Organizations

will often suffer damage themselves during an emergency, and thus may not be as capable as they would under ideal circumstances. Emergency situations create personal and organizational stress - if an organization is not experienced in dealing with this stress, or organized to adapt to stress, then its durability may be affected.

- **Operational integrity** concerns the ability of an organization to operate autonomously. Ideally organizations in emergencies should be able to accept a task, request additional resources if required, carry out that task, and report its successful conclusion or any problems to the controlling organization.

5.7 Management structure

The management structure concerns the authority and reporting relationships between different organizations, and sometimes the relationships within an organization. There needs to be a clear and shared understanding of the internal and external relationships for organizations so confusion is minimized during emergencies. There should be agreement on the management structure from each and every organization involved in the plan. There are a number of commonly used management concepts in emergency management, including:

- **Command** is the direction of members and resources of an organization in the performance of the organization's role and tasks. Authority to command is established in legislation or by agreement with an organization. Command relates to organizations and operates vertically, within an organization.
- **Control** is the overall direction of emergency activities. Authority for control is established in legislation or in a plan and carries with it the responsibility for tasking and coordinating other organizations in accordance with the needs of the situation. Control relates to situations and operates horizontally.
- **Coordination** is the systematic analysis of an emergency situation and available resources, developing relevant information to inform organizations of viable alternatives for the most effective actions to meet specific objectives.
- The **lead organization** is the organization responsible for responding to a particular hazard or type of emergency.

Control of organizations during emergencies should be strategic and supportive in nature. The controller should consult with organizations as to **what** to do, but not tell them **how** to do it. The controller should also provide support by supplying organizations with information and resources.

In the event of an emergency occurring at the community level it is the responsibility of the local government organizations to take the necessary action. If the scale of the emergency is such that the resources needed to control it may exceed the community's capacity, the local government organization should alert and refer to the next administrative level (province, region, county, etc.). This level should be automatically placed on the alert when several communities are affected. If several provinces are involved, or the magnitude of the emergency exceeds their capacity to cope, the national plan is activated. In the event that even national resources are insufficient to deal with an emergency, international aid should be sought.

A possible management structure for the provincial level consists of a **task force**, and **six sectors**.

The task force consists of the Director of Response and Recovery Operations (overall emergency controller), and the heads of each sector. The sectors are:

- communications;
- police and investigation;
- search and rescue;

- health;
- social welfare;
- transport and lifelines.

The task force may be responsible for gathering, centralizing and disseminating information, coordinating activities, and deploying staff and resources. Table 5 shows this possible management structure at the provincial level. Community preparedness management structures should be designed to efficiently interface with the management structures at provincial and national levels.

Table 5
The six sectors¹²

	Communications	Police & Investigation	Search & Rescue
Head	Chief of communications	Chief of Police or National Guard	Chief of Fire Department/ Civil Defense
Role	maintain radio & telephone contacts between organizations, including within the area of operations	gather information, maintain public order & traffic flow, identify bodies	fire-fighting, rescue work, clearing rubble, protecting individuals & property
Organizations	post & telecommunication, interior, military, radio amateurs, etc.	police, national guard, customs, military	fire department & other rescue services, public or private companies, railway companies, utilities (water, electricity)
	Health	Social Welfare	Transport & Lifelines
Head	Director of Health	Director of Social Affairs	Director of Equipment & Public Works
Role	organize emergency care at the emergency site, medical transport to hospitals, hospital treatment & health care for evacuees & the community	in cooperation with local authority (mayor/district chief, etc.), organize reception & accommodation of emergency victims	mobilize & coordinate necessary means of transport, meet special needs of other services, restore communication routes to ensure general traffic flow, restore electrical power & drinking water supply networks
Organizations	health staff & resources (civilian, military, public or private), certified first aid workers, other services	local community services	public roads, road transport companies, breakdown services, repair workshops, military

Command, control & coordination

Command, control and coordination concerns the management of people and resources during response and recovery operations. This is comprised of:

- information management;
- resource management;
- decision-making;
- problem-solving;

- reporting to higher levels of authority.

These activities often take place in emergency coordination centers (ECCs). It is preferable to have ECCs established at national, provincial and community levels. A model for the establishment of such ECCs at the provincial level is:¹³

- the base headquarters established in the chief town of the province and staffed by the deputies of the Governor/Prefect and of the heads of the six sectors;
- the operational headquarters, located as close as possible to the area of operations and run by the Governor/Prefect and the heads of the six sectors.

The **base headquarters** operates out of the chief town of the province. It is staffed by the Governor/Prefect's representative, the representatives of the six sectors responsible for the emergency plan (generally the deputies), and communications staff. Its role is to liaise between operational headquarters and the relevant provincial or national services, process information and make sure instructions are carried out, and coordinate deployment of reinforcements/additional supplies and dispatch them to the emergency site.

Operational headquarters should be located close enough to the emergency site to allow speedy and permanent liaison between base headquarters and personnel engaged in operations and staff on stand-by.

It must be set up outside the danger zone and, if possible, in a pre-selected building that is easy to locate - a city hall, school or railway station, for example. Operational headquarters is run by:

- the provincial chief executive (Governor/Prefect) responsible for the overall management of operations;
- a task force headed by the Director of Response and Recovery Operations and composed of the heads of the six sectors in charge of the emergency plan and communications staff.

The task force is in charge of running operations under the Governor/Prefect's direction, centralizing and processing information, and requesting and deploying the necessary staff reinforcements/additional supplies.

The standard operating procedures listed in Table 7 will be required for the operation of ECCs. Individual organizations will also need to establish emergency operation centers and procedures for their own operations.

Table 7
Standing operating procedures for ECCs¹⁴

Activation	Operations	Closing-down
Open ECC	Message Flow	File messages & other documents
Mobilize staff	Information display	Release staff
Activate communications systems	Information processing	Close down communications
Prepare/post up maps & display boards	Control resource mobilization & deployment	Close down ECC
Draw up support staff roster	Drafting of situation reports	Organize operational debrief
	Decision-making	
	Briefings	
	Reporting to higher authority	

5.8 Strategies & systems

Strategies and systems that are commonly required for response and recovery include those for the six sectors described above, i.e.:

- communications;
- search and rescue;
- health and medical;
- social welfare;
- transport and lifelines; and,
- police and investigation;

as well as:

- information management;
- resource management;
- evacuation; and,
- hazardous materials.

Aspects of each of these areas are described below.

5.9 Communications

Communications concerns the means of relaying information between organizations, people, and the community. Adequate communications is essential to all aspects of response and recovery operations. In terms of electronic communications, the system should allow:¹⁵

- coverage from community to provincial and national levels, both within and between organizations;
- primary reliance on existing systems and compatibility between organizations' systems;
- dedicated frequencies for command, control and coordination;
- back-up systems and back-up power supplies; and,
- simplicity of activation and operation.

5.10 Search & rescue

The aim of search and rescue planning is to save life and minimize further injury to people and damage to property in times of emergency. Search and rescue services, supported as necessary by specialist groups such as marine and air rescue units, mountain rescue teams, etc., will:

- provide life-saving support to trapped persons during the course of rescue operations;
- save life by the rapid and safe extrication of trapped persons;
- save life by the rescue and recovery of persons who may be at risk in difficult terrain, or through abnormal weather conditions;
- recover the dead;
- provide temporary support, repair or demolition of damaged and dangerous structures to minimize further injury to people, damage to property or disruption to services.

Search and rescue planning details, operational and coordination measures necessary to ensure that all persons engaged in search and rescue are efficiently utilized before, during

and after the emergency period. Planning should take into consideration three categories of rescue workers:

1. survivors - who commence immediate work at the emergency site;
2. untrained personnel - who are motivated to assist the casualties and usually arrive from outside the immediate area;
3. trained personnel - who arrive in disciplined and organized rescue teams and can utilize the available resources, material and untrained personnel in carrying out life-saving tasks in an efficient and coordinated manner.

See also section 5.11 below concerning the integration of rescue and medical services.

5.11 Health & medical

Health and medical planning includes:

- public health;
- mental health;
- nutrition;
- hospital emergencies; and,
- the integration of rescue and medical services.

Public health

This section outlines some principles for emergency camp sites, communicable disease risk, water supply, food supply, vermin and vector control, disposal of refuse, and burial of the dead.

Emergency camp sites

In many instances, emergencies create a need for temporary shelter for significant numbers of people. Buildings that enable a concentration of people to gather are often used and these include schools, churches and other public institutions. Risks due to over-crowding and poor sanitation exist in these conditions, and it may be necessary to establish an emergency camp site to provide for the needs of the community. In all cases, the community should be involved in decisions concerning emergency camps, and should ideally be provided with sufficient information and resources to manage the emergency camps.

Factors to consider when selecting an emergency camp site include the following.

- **Topography** - The preferred site is a gentle slope on non-arable land with good drainage, away from the banks of a water course or where water tables may be high.
- **Water supply** - The site should be easily accessible to a good quality water supply.
- **Waste disposal** - This includes human excrement, refuse, and waste water. The site should allow disposal of these wastes without contamination of the water supply or water table.
- **Accessibility** - The site should be accessible by road and should have access to communications modes.
- **Prevalent diseases** - Sites that are infested with potential vectors of disease such as mosquitoes, ticks and mites should be avoided.
- **Climate** - Consider the extremes of temperature that may be encountered and locate the site where the maximum protection is afforded.

- **Expansion capacity** - The site should be capable of expanding to accommodate greater numbers of people.

The duration for which people occupy an emergency camp site will determine the standard of waste disposal required to minimize the risk of the spread of disease.

For temporary camps of **up to 3 days duration**, the recommended minimum facilities to be provided are:

- shallow trench latrines for the disposal of faeces;
- shallow trench urinals;
- sullage water (dishwater, shower and washing water) should pass through a strainer or grease trap prior to discharging into a suitable soakage pit, evaporation pad, or drain; and,
- dry refuse can be incinerated or bashed and buried.

Where temporary camps are expected to **exceed 3 days duration**, the waste disposal facilities need to be more substantial. In these instances, the recommended minimum facilities are:

- deep trench or bored hole latrines for faeces disposal;
- funnel or trough urinals;
- cold-water grease traps with a series of herring bone drains, evaporation pans or soaking pits for disposing of sullage water; and,
- an incinerator or large scale burial system for disposing of dry refuse.

Whilst the factors described in the siting and layout of an emergency camp will assist in reducing the risk of disease, adequate management controls are essential. These include:

- daily cleaning of the camp site;
- education of occupants in basic sanitation and hygiene procedures;
- appropriate siting of occupants of different cultures or religion;
- maintaining human dignity and privacy;
- appropriate methods for providing information and advice to occupants; and,
- activities to reduce boredom.

Communicable disease risk

The risk of communicable diseases after an emergency is influenced by six factors, including:

- pre-existent levels of disease;
- ecological changes which are the results of the emergency;
- population displacement;
- changes in population density;
- disruption of public utilities; and,
- interruption of basic health services.

Some diseases only pose a threat in areas where they are endemic. These include malaria, louse-borne typhus and plague. Thus, a displaced population moving from a non-endemic to an endemic region will be at increased risk.

An increase in population density caused by population displacement provides the opportunity for an increase in person-to-person transmission of communicable disease. Emergencies may create opportunities for increase in the numbers of disease vectors. Fleas and lice may increase in crowded living conditions and mosquito breeding sites may expand. The failure of water supplies and sewage systems can also result in increased disease transmission.

Water supply

A good, safe water supply is essential for the well-being of any community. During emergency situations, the normal water supply may be disrupted or contaminated, therefore a safe water supply should be provided to minimize the risk to public health.

Where warning of an impending emergency is possible, the community should be encouraged to obtain a supply of safe water for their personal consumption in the immediate aftermath of the emergency. During floods and after cyclones, unprotected water supplies are almost certain to be polluted and will need treatment before consumption.

Minimum water requirements for people depend on the situation but, as a general indication, the following amounts are desirable:

- individuals - 15-20 liters per person per day (the absolute minimum for survival is 3-5 liters per day);
- medical facilities - 40-60 liters per person per day;
- feeding centers - 20-30 liters per person per day; and,
- sanitation facilities - 2-5 liters per person per day for many latrine systems.

The water needs for individuals increases with air temperature and physical exertion. In all cases, the more convenient the supply, the higher will be consumption. People who have been displaced and concentrated into emergency camps for any reason require more water than they previously needed, because of crowding and other environmental factors.

Food supply

In areas susceptible to emergencies, the population should be encouraged to maintain a supply of 'long life' basic food rations sufficient for a family for 4-7 days. Where mass feeding needs to be undertaken, must be health precautions in the storage, preparation and distribution of food to limit the risk of an outbreak of food-borne disease.

Actions to ensure safe food preparation include:

- quality control of all incoming food, including donated products, to detect spoilage and contamination;
- provision of food that is consistent with the normal dietary requirements of the population being fed;
- provision of safe water supply;
- control of insects and rodents;
- provision of adequate storage facilities;
- adequate disposal of both liquid and solid food wastes;
- adequate washing and sanitizing of all kitchen utensils;
- supervision of food preparation areas;
- use of appropriate cooking methods; and,
- supervision of all food handlers.

Vermin & vector control

Vermin and vectors are disease carriers that develop rapidly in an uncontrolled or disturbed environment. Emergencies provide an opportunity for an increase in the transmission of disease that already exists within a region.

Areas that may need surveillance to control vermin and vector proliferation include:

- food areas (preparation, storage and eating);

- refuse collection areas and tips;
- sewerage disposal areas;
- damaged food premises, food manufacturers, food warehouses, cool stores, commercial kitchens, and food storage areas;
- damaged or destroyed animal shelters (poultry sheds, piggeries, stables, etc.);
- dead animals;
- properties reduced to rubble, particularly kitchen areas, refrigerators etc..; and,
- any area where people congregate.

Infectious disease can be transmitted by the following means:

- airborne - spread through the air from a source to a person;
- direct or indirect contact - transmitted from source to person, including via body fluids;
- water/food borne - carried in water or food and ingested; and,
- vector borne - transmitted to a person by another host.

To mitigate the transmission of infectious disease:

- minimize the population density to reduce the person-to-person contact;
- provide appropriate sanitation and water facilities;
- be aware of the existing disease prevalence in the emergency area and evacuation/relocation areas; and,
- provide for the adequate control of disease vectors.

Disposal of refuse

Refuse can be categorized as:

- putrescible garbage (wet garbage) such as food scraps, kitchen waste, vegetables, etc.;
- dry refuse such as paper, tins, bottles, rags, cardboard, ashes, etc.;
- indestructible rubbish such as building materials;
- dead animals; and,
- hazardous waste.

Where the usual garbage disposal sites are either inaccessible or unusable for any reason, the preferred methods for disposing of refuse in an emergency are **sanitary landfill** and **incineration**.

Burial of the dead

The burial of the dead is not normally a public health issue. However, advice on the storage and disposal of bodies may be sought from health officials.

There is minimal risk of disease from bodies awaiting burial although they should not be allowed to contaminate water sources. Some factors for managing the deceased are:

- attempt to gather all remains and identify for both cultural and scientific reasons;
- where possible, store in a refrigerated area;
- tag body and parts to identify and to relate to the position in which they were found; and,
- in many countries, certification of death and autopsy must occur before disposal of bodies.

The method of burial or cremation normally practiced within the community should be utilized. Cremation is not justified on health grounds and burial is the best method if it is socially acceptable.

Mental health

Stress reactions

The severity of psychosocial reactions to an emergency will depend on many factors in the individual and the community. Where there is great loss of life, there is likely to be much grief and disruption of family and community life. Loss of homes and property may destroy the sense of the community and create stress in association with the hardships. Where support is available and some meaning can be made of what has happened, and especially when there are opportunities for individuals and the community to be actually involved in their own recovery, the outcome is likely to be better. Where there is obvious blame, human negligence, malevolence or violence, and little support, the outcome is likely to be adverse.

Emotional reactions may be divided into the **immediate experience** during the emergency and those **later** emotional reactions occurring after the event, some of which may appear soon and others late. There may also be specific reactions, e.g.:

- grief;
- alcohol, drug abuse and family problems;
- secondary psychosocial stressors;
- post-traumatic stress disorder;
- stress upon rescuers; and,
- specific effects on children.

Certain specific stressors can arise in the wake of emergencies, consequent upon social changes. These include:

- displacement of individuals to other geographical areas;
- housing people in camps;
- unemployment;
- inactivity and lack of recreational possibilities;
- fostering of dependency in survivors;
- general disruption of the social fabric; and,
- the breakdown of traditional forms of social support.

'Temporary' emergency camps providing inadequate facilities are known to house victims for years. Disruption of families can also have important psychosocial consequences upon the members and particularly on small children with no accompanying adults.

Unnecessarily hasty procedures for dealing with dead bodies, under the guise of preventing outbreaks of communicable diseases, can lead to such rapid burials that proper identification may not be possible and full mourning procedures may not occur. Likewise, over-enthusiastic vaccination programs may be initiated for the same reason. Other misbeliefs may lead to unnecessary, extra stress on victims of emergencies.

Stress upon rescuers

There are two categories of rescuer: the non-professional and the professional.

The stress upon the non-professional rescuers may resemble that on the victims, in that they may be caught up in the impact of the emergency. As volunteers or bystanders in the period before professional help arrives, they may suffer the terrible trauma of not being able to achieve success in their rescue attempt. For non-professionals and professionals alike, failure to be able to rescue victims, especially children, is a significant stressor comparable

only to the loss of a colleague. Even a professional rescuer may be overwhelmed by the magnitude of an emergency. The available resources usually seem too small, creating feelings of powerlessness and of being terribly alone. As always, stress is better endured when experienced as an active participant rather than as a passive victim. In emergencies affecting people one knows personally, such as in company and community emergencies, rescuers especially need to adopt a very 'professional attitude'.

The majority of rescuers report a need to work through the emotional emergency experiences by sharing their feelings with others. Debriefing should aim to:

- review the helper's role;
- ease the expression of feelings;
- explore particular problems encountered and solutions found;
- identify positive gains;
- explore consequences of disengagement;
- identify those at risk;
- provide education about normal reactions to acute stress; and,
- explain how to cope with stress adaptively.

Management of mental health

Mental health services should be integrated within the framework of the primary care, because:

- many potential users do not come to a facility which is openly labeled as a mental health service, since they do not see themselves as people needing specialized help but consider themselves only as victims of extreme adversity.
- it is well known that the large majority of cases of psychological distress among attenders of health centers go unrecognized, do not receive proper care and represent an important burden for the health services.
- the primary health care network, thanks to its central position in the community, can guarantee proper follow-up of victims and their families for as long as they need.

In this framework, the role of the specialized mental health team should essentially be one of supervision and training, and only especially difficult cases should be referred for direct treatment.

The mental health professionals at the national or provincial level should be responsible for:

- teaching preventive psychiatry;
- leadership;
- mental health care during the first six months;
- planning long-term follow-up of victim groups; and,
- mobilizing support at different levels.

Training programs for mental health

Target groups for training programs should come from both the health and other sectors. These should include primary health care workers, medical doctors of first aid teams, community nurses, or other trained health care workers such as social workers, administrators from local and national administrations, policemen and firemen in reserve teams.

Training programs for health care providers should include:

- health aspects of emergencies;
- psychological and psychophysiological concepts about people's reactions after an emergency; and,
- variations in the way different groups of people perceive the risk from different types of hazards.

Training programs should show simple ways of dealing with psychosocial problems and teach simple skills to recognize and treat psychologically distressed victims (interviewing skills, counseling, brief and simple psychotherapeutic methods, targeted pharmacotherapy, group therapy, etc.).

Nutrition

Energy & protein requirements

During a nutritional emergency, different groups of people are not all equally affected and thus have different needs. Relief foods and other related resources may be scarce, and should be targeted to the people in greatest need, as rationally as possible. Determinations of nutritional status, or the level of malnutrition, are needed.

For a population engaged in light activity, whose age and sex distributions correspond to those typically found in a developing country, the average intake per person per day should be approximately 2,100 calories. The average safe level of dietary protein intake per person per day is approximately 46 grams, if the food is a mixed cereal/legume-based diet.

Several special groups within a population have particular energy and protein requirements and may be particularly vulnerable to nutritional deficiencies.

- **Women who are pregnant** need to consume between 200 to 285 calories per day above the energy requirements of non-pregnant women, depending on their level of activity, and an additional 7 grams of dietary protein.
- **Women who are breast feeding** need to consume an extra 500 calories and an average of 18 additional grams of dietary protein daily. If the diet is predominantly coarse grains such as millet and maize, even more dietary protein may be required.
- **Children under five years of age** are growing rapidly and require more energy and protein per kilogram of body weight than adults, and are also more vulnerable to malnutrition-related infectious diseases. Infants require on average 103 calories/kilogram during the first year, the average five-year-old needs 90 calories/kilogram, and the average 10-year-old 67 calories/kilogram. They also need concentrated sources of energy and protein.
- An **adult male performing light occupational work** needs an average of only 41 calories/kilogram.

If average daily energy intake falls below 2,100 calories, and certainly below 1,900 calories, basic nutritional needs will not be met at least for some of the population. This will increase the likelihood of malnutrition and ill-health, especially in vulnerable groups such as young children and women. It will also delay the recovery time for a population already debilitated by prolonged food deprivation. When food is scarce, providing enough energy is the first relief priority. If a person does not consume enough energy, the body will begin to burn up the protein needed for growth and repair.

Assessment & surveillance of nutritional status

During a nutritional emergency, relief foods may be scarce and may need to be provided to the people in greatest need. Food relief programs should be planned and implemented on the

basis of an initial, rapid nutritional assessment followed by systematic surveys and ongoing surveillance of nutritional conditions. Suitable arrangements must be made to rapidly and objectively measure the nutritional status of:

- communities -
 - * to assess the extent and severity of malnutrition, including vitamin and mineral deficiencies,
 - * to decide if and what type of feeding programs are needed and set food distribution priorities,
 - * to define ration composition,
 - * to ensure that fuel and cooking utensils are available, and
 - * to monitor changes in nutritional status over time;
- individuals -
 - * to screen (i.e. select) for supplementary or therapeutic feeding, and
 - * to monitor their nutritional progress.

Children under 5 years are particularly vulnerable to malnutrition and are a priority target group for nutritional assistance in any food emergency. Their nutritional status is a good indication of the overall nutritional situation in most societies, and surveys are usually based on measuring the status of children 6 months to 5 years old, or children shorter than 110 centimeters when ages are not known.

There are a number of indicators of nutritional status.

- **Weight-for-height** is the best method to measure and monitor community nutritional status in food emergencies and to screen individuals in need of special nutritional assistance.
- **Arm circumference** can be used as a quick, simple, but less accurate method of initial screening.
- **Oedema rates** are an essential indicator when kwashiorkor is prevalent in the population.

Weight-for-age and height-for-age are **not** useful assessment measures or screening tools in emergencies, though they can be used for continuous monitoring of individual children's growth speed, and in assessing long-term nutritional well-being once acute malnutrition has been addressed.

Survey results are relevant and useful only if sampling techniques are standardized and properly applied to ensure that the individuals measured are representative of the whole population. Results must always be interpreted with caution, taking account of other relevant information.

Management of a nutritional emergency

Vitamin and mineral deficiency **prevention** involves ensuring that people receive or have access to foods containing sufficient quantities of essential vitamins and minerals. This includes food items in distributed rations (including fortified cereals, if necessary), access to local markets, and produce from small garden cultivation. Vitamin and mineral deficiency **treatment** consists of administering high doses of missing nutrients. There are two main strategies for managing a nutritional emergency: general food distribution and selective food distribution.

General food distribution provides enough food to maintain the health and nutritional status of the affected population. If the population is entirely dependent upon food distribution, the general ration must provide for a minimum intake of approximately 2100 calories/person/day;

more if the population is malnourished, exposed to cold or does heavy physical work. The general ration is normally given dry, for people to cook at home. Breast-feeding must be encouraged, and wet-nurses be found, if possible, for infants who cannot get their own mother's milk.

Selective food distribution provides additional food to specific, vulnerable groups and those needing nutritional rehabilitation. It has two sub-categories, supplementary food distribution and therapeutic feeding. Supplementary food distribution gives additional food to nutritionally vulnerable groups including moderately malnourished children and pregnant women, either through on-site feeding of cooked meals (350-500 calories/day) or a dry take-home ration (700-1000 calories/day). Therapeutic feeding is a rehabilitative diet for those with severe protein energy malnutrition (PEM), and is needed to reduce the death rate among infants and young children.

The food supplied in general and supplementary feeding programs must:

- match the food needs and habits of the recipients;
- be convenient to transport, store and distribute; and
- be equitably distributed.

Good organization in the field and coordination between all concerned)are the keys to the success or failure of a food distribution operation. Emergency feeding programs will fail if administration and operations are poorly managed. Operations must be supervised closely to reduce thefts and other waste of resources. Transportation must be carefully planned. Storage at the local level must meet some minimum requirements. Of these, protection against rain, cleanliness, rotation of stocks and up-to-date stock-cards are the most important.

Hospital emergency planning

Hospital emergency planning is an integral part of both the multisectoral community emergency plan and the health sector emergency plan. The process for planning is the same as that for communities or organizations and produces many outputs, only one of which is a written emergency plan.

Hospital **emergency planning** has two aspects:

- protection of the hospital, hospital services, patients and staff from harm caused either internally or externally; and,
- the provision of hospital services to the community before, during and after an emergency.

Consequently, hospital emergency planning should be based on the following:

- a vulnerability assessment of the community to determine the likely medical needs of the community before, during and after emergencies;
- a vulnerability assessment of the hospital to determine the likely harm caused to the hospital by both **internal** and **external** emergencies; and,
- an assessment of the reception and treatment capacities of the hospital.

Hospital emergency management **policy** may be needed in the following areas:

- the interaction between the hospital and other hospitals and medical centers;
- the interaction between the hospital and rescue, volunteer, and government organizations;
- the assignment of major responsibilities within the hospital for emergency prevention, preparedness and response;
- the acquisition and maintenance of emergency resources; and,

- the criteria for major evacuation of the hospital and for hospital relocation.

There are two aspects to hospital **vulnerability assessment**: the vulnerability of the community; and the vulnerability of the hospital as a service provider. Emergencies can be purely **internal**, **external** or combined **internal/external**. Thus there are three basic scenarios that hospital emergency planning must satisfy:

- an emergency that disrupts the ability of the hospital to provide its normal services, but that doesn't cause harm to the community (an **internal** emergency);
- an emergency that causes harm to the community requiring increased medical services, but that doesn't disrupt the ability of the hospital to provide medical services (an **external** emergency);
- an emergency that causes harm to the community requiring increased medical services, and that also disrupts the ability of the hospital to provide medical services (an **internal/external** emergency).

Internal emergencies can be caused by a number of hazards, including fire, explosion, hazardous material incident, food contamination, or loss of electricity supply, water supply, or other service. Internal emergencies can quickly multiply into a number of contingent emergencies. For example, a fire may cause injury to patients and staff resulting in an overload on hospital services, hazardous materials incidents may lead to fires or explosions, etc.

Community vulnerability should be assessed to determine the likely demands on a hospital, or hospital system (a series of linked hospitals and medical centers). It is possible to develop a number of credible **external emergency** scenarios that may produce unusual medical demands on a hospital.

Integrating rescue & medical services

The effectiveness of the medical arrangements for emergencies depends on:

- operating as close to the emergency site as possible, though without taking unnecessary risks;
- collaborating closely with the rescue teams;
- commencing medical assessment and triage of casualties as quickly as possible; and,
- ensuring continuity of medical care for casualties along the whole length of the chain from the emergency site to hospitals.

This means that improvisation must be reduced to a minimum. One must therefore be able to rely on:

- emergency medical teams that are used for day-to-day emergencies;
- medical emergency response plans and procedures; and,
- personnel and equipment to reinforce the resources available for day-to-day emergencies.

The chain of medical care extends in space from the emergency area to the hospital receiving the casualties and in time from news of the emergency until the last casualty is admitted to hospital. The links of the chain are:

1. survivor and volunteer rescue and first aid;
2. search and rescue;
3. field medical services (including field medical teams and possibly field medical posts);
4. a transport service for medical evacuations;

5. hospitals.

Amongst the millions of communities in the world, there is an almost infinite variety in the day-to-day organization of rescue and medical services, the capacity of a community to respond to emergencies, the likely effects of hazards, and community vulnerability. Therefore it is impossible to prescribe the way in which search and rescue and medical services should be integrated. In a given situation it may be possible to:

- attach field medical teams to rescue teams;
- establish a number of field medical posts;
- use a casualty transport system with on-board paramedics; and,
- send casualties to a range of hospitals with extensive emergency medical services.

However, in some communities and emergencies the links in the chain of medical care may be incomplete or non-existent. Table 6 shows a way that the links in the chain of medical care may be connected, and some functions for parts of the chain.

*Table 6
Integrating search and rescue, field medical services, and definitive medical care*

SEARCH & RESCUE	FIELD MEDICAL SERVICES	DEFINITIVE MEDICAL CARE
(rescue teams, bystanders, etc.)	(medical teams, medical officers, nurses, first aiders, ambulance, etc.)	(hospital services)
1. Assess site . 2. Select, deploy & manage rescue teams . 3. Locate casualties. 4. Identify & manage life-threatening conditions by performing primary assessment : D - Danger R - Response A - Airway B - Breathing C - Circulation. 5. Record details of first aid provided. 6. Liaise with field medical services further treatment is required prior to extrication. 7. Extricate surface & lightly trapped casualties & move to field medical service. 8. Extricate severely trapped casualties & move to field medical service.	1. Establish field medical post/s. 2. Identify & manage life-threatening conditions by performing primary assessment . 3. Establish nature & extent of casualties' condition by performing secondary assessment & initiate appropriate treatment. 4. Assign triage category to casualties, based on assessments. 5. Continue medical documentation of casualties. 6. Prepare casualties for evacuation to hospital according to triage category. 7. Provide medical assistance & advice to search & rescue personnel. 8. Provide surveillance of casualties awaiting evacuation. 9. Liaise with casualty transport service. 10. Evacuate casualties to	1. Prepare for casualty reception. 2. Identify & manage life-threatening conditions by performing primary assessment . 3. Establish nature & extent of casualties' condition by performing secondary assessment & initiate appropriate treatment. 4. Assign triage category to casualties, based on assessments. 5. Continue medical documentation of casualties. 6. Provide hospital treatment according to triage priorities & available hospital resources. 7. Undertake surgical procedures - this can normally be staged into hours or days permitting casualty transfer to more suitable facilities if necessary. 8. Provide post-operative care & release casualties.

appropriate medical facilities according to priorities.

11. Provide **information** to receiving medical facilities as necessary.

12. Treat minor injuries not requiring hospitalization.

5.12 Social welfare

Social welfare concerns the non-medical care of people and the community during and after emergencies. An emergency threatens the physical and emotional well being of large numbers of people. Individuals may experience bereavement and loss, physical injury, and separation from families. They may experience personal losses of clothing, housing, food, household goods, employment and income. Communities may be affected by severe damage to lifeline services (power, water, gas, electricity and sewerage) and transport. Therefore providing for the welfare of the victims of an emergency is a fundamental task of emergency preparedness at all levels of government.

Various factors such as weather, health hazards, or disruption of supplies may require evacuation from all or part of the emergency area. Planning and organization for the care of the homeless are essential to emergency preparedness.

The tasks that may be required include:

- accommodation (temporary, including emergency camps);
- appeal management;
- child and aged care (temporary);
- clothing and household items;
- counseling;
- emergency feeding;
- financial assistance;
- insurance and legal advice;
- public information;
- referral service; and,
- registration and inquiry.

Social welfare planning should describe how the immediate welfare needs of the people should be met during the period of a emergency. It should prescribe procedures to meet those needs during an evacuation and subsequent rehabilitation if required. It should also emphasize that welfare is not just the responsibility of specialized government organizations, but also involves all other government and non-government organizations, and should set out the tasks and responsibilities of these organizations.

5.13 Transport & lifelines

Transport is an important factor in the management of an emergency. It includes the identification and mobilization of transport resources and control of movement. The aim of transport preparedness is to prescribe arrangements for the identification of resources (road vehicles, rail, shipping, aircraft and access routes) to ensure the best use of these resources. Planning aspects include:

- arrangements for the identification, acquisition, or organization of public and private transport resources at all levels of government;
- the identification, regulation, restoration and maintenance of access routes during an emergency;
- transport coordination; and,
- compatibility with provincial and national transport planning.

An emergency is likely to disrupt **lifeline services** (electricity, gas, water, petroleum fuels and communications) essential to the survival of a community. Apart from the impact on the stricken area, this may have implications for other parts of the province or country, particularly if electricity generation, gas production capacity or water supply systems are reduced by the emergency, or if transmission through the affected area is interrupted. Supply of other energy sources such as vehicle fuels, aviation fuel, heating and cooking fuels may become irregular, or existing stocks may be destroyed.

Restoration of lifeline services is an important part of restoring normal conditions. Those energy forms that can be supplied by road, rail or sea transportation methods (including LPG, gasoline, diesel and coal) must be dealt with in transport planning.

The aim of lifeline services planning is to organize for the restoration, operation and maintenance of all lifeline services under emergency conditions, to ensure the best use of available systems and resources in the event of an emergency, including:

- identifying electricity, gas, and water supply systems at provincial and community level;
- determining what resources would be needed for restoration of damaged systems and how these may be obtained during an emergency;
- ensuring that regular supplies of all services are restored as soon as possible and in order of priority; and,
- establishing guidelines for operational emergency plans for provincial and community organizations.

In general, the following principles should be followed in an emergency:

- electricity supply systems should be accorded a high priority for restoration and maintenance because of the life-preserving and communications purposes to which the system is put;
- piped gas supply systems should be accorded priority where these systems are used for fueling power stations or form a major energy source for the community;
- the water supply systems should be given a priority where there is possible contamination of existing supplies, and where the sewerage systems are causing a risk to public health.

5.14 Police & investigation

An emergency creates complex problems for the maintenance of law and order and the performance of day-to-day police functions. There is a need to maintain law and order even during emergencies. This may prove difficult given that police will most likely be heavily committed to emergency operations. The police organizations will need to develop operational plans that ensure sufficient resources for normal policing and investigation.

5.15 Information management

Information management concerns the gathering, handling, use and dissemination of information related to an emergency. Tasks and systems include:

- warning systems;
- emergency assessment;
- management of operational information;
- public information.

Warning Systems

Organizations responsible for emergency management should develop early alerting and warning systems for their own use and the use of others. These early warning systems could cover:

- outbreaks of disease and epidemics;
- shortages of food;
- severe weather;
- other natural hazards;
- movements of population;
- technological and industrial hazards;
- social and political unrest;
- economic crises; and,
- war and insurgencies.

If early notification of the emergency can be transmitted before it strikes, the effectiveness of emergency preparedness measures can be greatly improved, especially during the early stages of an emergency. The warning system must be developed to alert all emergency organizations at all levels, and the communities, of the possible need for implementing emergency preparedness measures.

Alerting consists of a number of response phases, including:

- alert - the period when it is believed that resources may be required which enables an increased level of preparedness;
- standby - the period normally following an alert when the controlling organization believes that deployment of resources is imminent - personnel are placed on standby to respond immediately;
- call-out - the command to deploy resources; and,
- stand-down - the period when the controlling organization has declared that the emergency is controlled and that resources may be recalled.

In order to implement these phases, there needs to be:

- a protocol of which organizations to alert for which emergencies and what tasks;
- a contact list for all organizations;
- duty officer rosters in all organizations to ensure that the organization can be contacted out of hours; and,
- a description of the type of information that should be supplied in the various phases of alerting.

A community **warning** should cause appropriate public responses to minimize harm. Warning messages should:¹⁶

- provide timely information about an impending emergency;

- state the action that should be taken to reduce loss of life, injury and property damage;
- state the consequences of not heeding the warning;
- provide feedback to response managers on the extent of community compliance;
- cite a credible authority;
- be short, simple, and precise;
- have a personal context;
- contain active verbs; and,
- repeat information regularly.

Warnings should be transmitted using as many media as available. Warnings may be initiated in several ways. They may originate from the scene or the potential scene of the emergency and be passed upwards. Or they may originate from national government and be passed down to the scene of the impending emergency.

Emergency planning for warnings should:

- outline the procedures for passing alerting and warning messages from local to national government;
- detail the procedures for passing alerting and warning messages from national government to local administrations and between government organizations;
- detail the procedures to be followed in response to specific threats; and,
- describe the types of warnings to be given to the general public.

Emergency assessment

A critical component of any emergency response is the early conduct of a proper emergency assessment to identify urgent needs and to determine response and recovery priorities for an affected population. An emergency assessment provides objective information about the effects of the emergency on a population, generated on the basis of rapidly conducted field investigations. The early completion of this task and the subsequent mobilization of resources to address urgent needs of the affected population can significantly reduce the adverse consequences of an emergency. Inadequate assessment of the human needs at the emergency site leads to inappropriate and delayed response and recovery services.

Assessment is the process of determining:¹⁷

- the impact an emergency has had on a community;
- the priorities for immediate emergency action to save and maintain life;
- the resources available; and,
- possible strategies for long-term recovery and development.

Information to collect during an emergency assessment may include:¹⁸

- geographic extent of emergency's impact;
- population at risk or affected;
- presence of continuing hazards;
- injuries and deaths;
- availability of shelter;
- access to drinkable water;
- nutritional status of affected population;
- current level of sanitation;
- status of health care infrastructure;
- level of communications network;
- status of transportation system; and,
- incidence of communicable disease.

Management of operational information

The purpose of operational information is assist in problem solving and decision making during response and recovery operations. The management of information concerns decisions to improve the processes of collection, recording, verification, interpretation, structuring, collation, and dissemination of emergency management information. This will require determination of the objectives of the emergency management strategy, users of the information, and users' information needs (which may include type of information, form of information, accuracy, timeliness, and comprehensiveness). The information management processes should ensure that the right information is collected in a logical fashion, all possible information sources are utilized, and a flexible and sustainable approach is adopted.

Public information

Public information in emergencies is the deliberate, planned and sustained effort to establish and maintaining mutual understanding between those managing the response to the emergency and the community. It means ensuring answers to the questions: what is happening? what should the community do? what might happen?

Public information planning seeks to ensure that those who need the information in an emergency get it - and those who provide the information give it in an accurate, direct and timely way. Those who need information include:

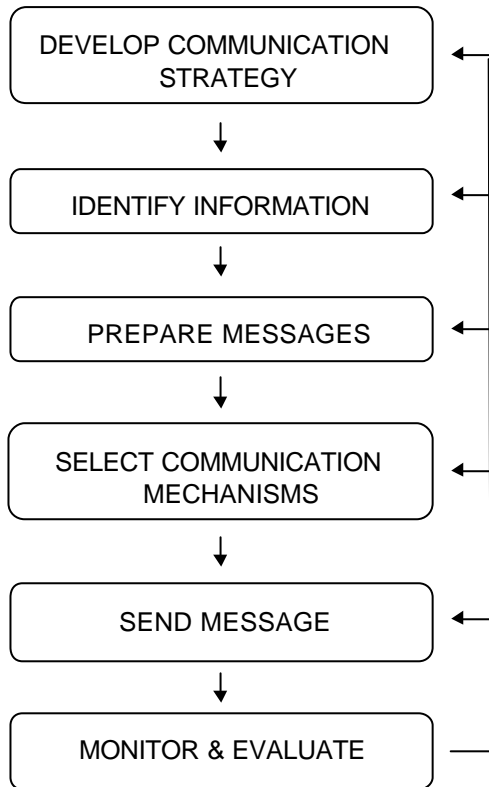
- people who are directly affected by the emergency and who may work to ensure their own safety;
- people who organize the emergency response;
- people who disseminate public warnings and information;
- people who can contribute to an emergency response;
- people who are indirectly affected by the emergency; and,
- the news media.

Those who provide information include:

- people who are directly involved in the emergency;
- people who organize the response to the emergency;
- organizations with specific roles in responding to the emergency;
- the news media.

It is important to involve the news media at the planning stage of emergency preparedness. With good established relationships, the media can provide significant professional assistance during the response phase, rather than become a hindrance or deterrent. When an emergency strikes, it is too late to think about planning for the role of the media in emergencies. There are a number of steps to communicating effectively with the public.¹⁹

Figure 10
A process for communicating with the public



The **communication strategy** should outline:

- who determines what information should be collected;
- who collects and collates information;
- who selects what information should be communicated;
- who prepares messages;
- who authorizes messages; and,
- who contacts media.

It is recommended that an experienced media relations officer be appointed to coordinate public information. This person should answer directly to the emergency controller or commander. The information coordinator should:

- establish contacts with key media personnel, understand how they work, brief them on his role, and determine how they can work together;
- liaise with the national emergency taskforce and committees;
- develop a timetable for disseminating emergency information, including

- advertisements for the emergency tone (on radio and television) and symbol; and,
- present messages as a media package including features, background information and messages, with audio and/or video tapes when possible and appropriate.

To **identify information** the information coordinator should consult with emergency management authorities to:

- identify main issues;
- identify priority issues and collect data; and,
- prepare a profile of the target audience.

Prepared messages should answer the following questions:

- Who? ... is affected, the message source, etc.;
- What? ... is the message, the problem, the solution, etc.;
- When?... did it happen, should it happen, when to act;
- Where?.. what place is affected, where to go, etc.;
- Why? ... is it important that message be followed;
- How? ... to respond, to deal with the situation, etc.;

and:

- reassure the audience;

- capture the attention of the audience through the use of an emergency tone, symbols, etc.;
- be clear and easy to understand and avoid technical jargon;
- say where further information and help can be obtained;
- be concise (15 - 60 seconds);
- give accurate information (technically sound);
- be current;
- use prominent personalities to endorse and give credibility to the messages; and,
- state specifically and precisely what behavior is required, what is expected, and what must be done.

In the **selection of communication mechanisms** and **sending the message** it is advisable to use a variety of media, such as television, radio, newspapers, newsletters, posters, ham radio, public address system, government personnel, volunteers, etc. The possible forms of the communication could be:

- news releases;
- public service announcements;
- talk shows including call-in programs;
- advertisements;
- flyers, circulars, etc.; and,
- local community personnel, local emergency management committee members, service clubs, voluntary organizations, police and fire department officers.

Key messages and important releases should be broadcast at prime time, which is usually between 6:00 am - 8:00 am and 5:00 pm - 7:00 pm in most countries. Remember that the electronic and print media have news deadlines. The information coordinator should discuss deadlines with media personnel and determine the best times of the day for media releases. These releases should then be scheduled, and media informed of the time and place of releases and briefings. If the media are supplied with accurate, complete information on time they will be of great assistance in emergency response and recovery.

Before sending messages to the media, the messages should be tested on a few people just like those you are trying to inform. This ensure that your message has the exact effect you want.

Monitoring and evaluation should focus on the effectiveness, efficiency and appropriateness of the public communication strategy and provide information for improving it. This can be done through exercises, monitoring media messages before and during emergencies, surveys, questionnaires, and formal reviews after emergencies.

5.16 Resource management

An emergency creates special problems of resource management. Arrangements essential to regular supply such as transportation routes, communications networks, and financial systems through normal credit facilities may be disrupted or threatened. Existing resource stocks may have been damaged or destroyed. The requirements for supply may thus grow at precisely the time when the means of supply have diminished. The emergency will also create demands for additional resources - of machinery and materials to rebuild and repair facilities, of fuel for machinery, and of food and other resources not only for those stricken by the emergency but also for those involved in the recovery work.

Resource management planning for emergencies is likely to focus on the needs of rescue, medical, welfare and recovery services forming part of the emergency response effort. Such planning must not neglect the ongoing needs of the community. Without an efficient supply

system the response to the emergency and the recovery of the local community and economy will be severely hampered.

Consequently, emergency plans must establish in advance of an emergency a resource management organization, as well as supply and procurement procedures that will operate once an emergency appears imminent or has occurred. Possible disruptions to the local economy and the effect on the welfare of the community must be considered in this planning, and if necessary, measures prepared to overcome them.

Resource management planning must cover:

- the principles of supply in an emergency, including the prepositioning of essential stockpiles;
- the roles and responsibilities of organizations at all levels in providing supply systems in the event of emergency; and,
- the procedures that should be established for the proper accounting for resources obtained under this plan.

If specialist equipment is to be used, always ensure that a trained operator accompanies the equipment.

No matter what the emergency, or the condition of the community, resources should always be sought at the community level first. This is not purely for reasons of cost and efficiency. The swamping of a community with excessive outside resources can:

- bankrupt local businesses;
- destroy local pride and self-sufficiency;
- lead to an unnatural degree of dependence on regional, national and international resources; and,
- increase vulnerability.

The **management of supplies** from external sources after an emergency can be accomplished using a system known as the 'Supply Management Project in the Aftermath of Disasters' (SUMA). SUMA is a systematic approach to the identification of supplies received using trained personnel and computer software to manage relief supplies and the sorting process during an emergency. This system has been developed for supplies received from outside of an emergency-affected country, and is currently being used at the sub-national level.

A basic kit of **materials for health emergencies** is described in *The New Emergency Health Kit*.²⁰ The kits contain drugs and medical supplies that can be used to satisfy the basic medical needs for 10,000 people for approximately 3 months.

The kits when assembled weigh 860 kilograms and occupy 4 cubic meters, which means that they can be transported en masse in a small truck. To allow the appropriate dispersion of drugs and medical supplies, and to allow the kit to be transported by means other than truck, the kit can be packaged as separate units.

There are 10 **basic** units, containing drugs, renewable supplies and basic equipment, each weighing 45 kilograms, which are intended for use by basic health workers for populations of 1,000 people. There is one **supplementary** unit, containing drugs, essential infusions, renewable supplies and equipment, for physicians and senior health workers for a population of 10,000 people. This kit contains no material that is in the basic unit, and must be used with the basic units.

Resupply of drugs and medical supplies following the receipt of a health kit should be based on actual need, rather than request for complete kits.

Stockpiles of **emergency relief supplies**, or requests for such supplies, can be based on the publication *Emergency Relief Items: Compendium of Generic Specifications*²¹. This publication, in two volumes, specifies resources that are the most suitable for emergency relief, and could provide guidance and assistance to:

- “donor governments as well as national governments and institutions in developing countries concerned with the planning budgeting and execution of assistance in emergency situations; and,
- procurement officials of the UN system and within NGOs and Donor Development Agencies involved in the acquisition of emergency relief items.”

The first volume contains equipment specifications and provides guidance on needs and recommended responses for:

- telecommunications equipment;
- shelter, housing, storage and cooking appliances;
- water supply systems;
- food items;
- sanitation and hygiene items;
- materials handling equipment; and
- power supply systems.

The second volume contains specifications of medical supplies and equipment, including essential drugs.

5.17 Evacuation

Evacuation is itself a hazard, in that it may place members of a community in danger, and will remove them from their familiar surroundings under stressful circumstances. Evacuation is not a one-way trip - arrangements are required for returning evacuated people. Some possible stages of evacuation are:²²

- warning;
- withdrawal;
- shelter and feeding;
- reunion; and,
- return.

The following will need identifying:

- assembly area sites;
- evacuation center or reception sites;
- evacuation routes and alternatives;
- organizations responsible for assisting evacuation;
- teams for the registration of evacuees;
- transport arrangements; and,
- means of operating evacuation centers.

5.18 Hazardous materials

Hazardous materials include: explosives; gases - compressed, liquefied or dissolved under pressure; flammable liquids; flammable solids; oxidizing agents and organic peroxides; poisonous (toxic) and infectious substances; radioactive substances; and, corrosives.

These materials may cause emergencies, or become involved in emergencies of other causes. When contained, stored, used, or disposed of in appropriate ways, these materials are not harmful. But when released, burnt, damaged, etc. they may be harmful to people, property and the environment.

The following preparedness actions are required for a community, building or organization to reduce the possible harm caused by hazardous materials.

- Reduce the quantity of hazardous materials stored to the minimum - the less materials stored the less that may cause harm.
- Ensure the production, storage, transportation, use, and disposal of hazardous materials is carried out according to the relevant standards and regularly audited.
- Only allow trained people to handle hazardous materials.
- Maintain an inventory of hazardous materials types, quantities and locations.
- Collect and have available material safety data sheets on all materials (these detail nature of the materials, the hazards associated with them, and emergency response and first aid directions).
- Develop generic hazardous materials emergency plans.

5.19 Content of emergency plans

The content of an emergency plan depends on: the hazards the community faces; the types of community vulnerability; the culture of the community; the means of organizing emergency management chosen by the community; and, the organization of emergency management at the provincial and national levels. Table 8 shows some possible contents for a community emergency plan.

Table 8

Possible contents for emergency response and recovery plans

Chapter	Section	Content
i. Introduction	Aim, objectives, scope, authority Related documents Definitions & abbreviations Vulnerability assessment	(refer to appendix) (refer to appendix) (refer to appendix)
ii. Management structure	Emergency powers Control Command Communication Emergency coordination centers Post-emergency review	powers to release or commandeer resources relationship between organizations & organizational levels management of ECCs management of debriefs & review
iii. Organization roles	Description by role Description by organization Emergency operation centers	description of roles & responsibilities management of EOCs
iv. Information management	Alerting and warning Damage assessment Information processing Public information Reporting Translation & interpreting	means of gathering information means of handling information types of information released reporting to higher authorities language interpretation
v. Resource management	Resource coordination Administration Financial procedures External assistance (provincial, national, & international)	resource analysis resource deployment & monitoring accounting for expenditure
vi. Specific plans	Search & rescue Evacuation Health & medical Social welfare Hazardous materials Transport & lifelines Police & investigation	specific plans of action for specific aspects of response & recovery
vii. Appendices	Issue history & amendment list Distribution list Definitions & abbreviations Summary of vulnerability assessment Maps Planning groups Emergency contacts	the means of distributing & maintaining the emergency plan short list of essential terms & abbreviations, & their meaning description of likely effects of emergencies hazard, community, & vulnerability maps names & contact details of relevant people & organizations

Summary

- Emergency planning should be based on an assessment of vulnerability.
- An emergency plan is an agreed set of arrangements for responding to and recovering from emergencies, involving the description of responsibilities, management structures, strategies and resources.
- The emergency planning process can be applied to any community, organization, or activity.
- The process of planning is as important as a written emergency plan.
- An appropriate planning group should develop emergency planning.
- Potential problem analysis can determine problems, causes, preventative strategies, response and recovery strategies, and trigger events.
- The resources required to support preparedness, response and recovery strategies should be analyzed.
- The roles and responsibilities of people and organizations must be defined and described.
- A management structure for emergency response and recovery should be developed based on normal management structures.
- A series of strategies and systems must be developed for response and recovery.

Chapter 6

Training and education

This chapter outlines processes and tools for training and assessing personnel and increasing community awareness.

The objectives of training and education in emergency management are that:

- the community is empowered to participate in the development of emergency preparedness strategies;
- the community knows the appropriate actions for different types of emergencies, and the organizations it can turn to for assistance; and,
- emergency management personnel are able to carry out the tasks allotted to them.

There are a number of possible training and education strategies that are suitable for different audiences and purposes. Strategy selection should be based on need, audience, purpose, available time, and available money and other resources.

Training and education strategies may include:²³

- workshops, seminars, formal education programs, or conferences;
- self-directed learning;
- individual tuition;
- exercises;
- pamphlets, videos, media advertisements, newsletters or journals;
- informal or formal presentations;
- training of the public, from school children to professionals; and,
- public displays or public meetings.

This chapter is divided into two sections, the first concerns a systematic approach to training that is useful for emergency management personnel, and the second concerns the development of public education strategies.

6.1 A systematic approach to training

The 'systems approach' to training is a process for the development of appropriate, effective and efficient training programs. The following table outlines the steps in the process, and these steps are further explained in the following sections.

Table 9²⁴

The systems approach to training

ACTIVITIES		OUTPUTS
1. Analyze training need	<ul style="list-style-type: none"> the job is analyzed & task performances, together with task conditions & standards, are listed training needs, & their priorities, are listed 	<ul style="list-style-type: none"> a list of task performances, conditions & standards a schedule of training & priorities
2. Design training	<ul style="list-style-type: none"> training is designed to suit the results of job analysis training objectives & assessments are written & placed in logical sequence 	<ul style="list-style-type: none"> sequenced set of training objectives & tests
3. Develop instruction	<ul style="list-style-type: none"> instructional methods & media chosen course program & content compiled the instruction is trailed & amended until it is successful 	<ul style="list-style-type: none"> a program of instruction which has been successfully trailed
4. Conduct instruction	<ul style="list-style-type: none"> the course is conducted tests are administered initial problems are remedied 	<ul style="list-style-type: none"> trainees who have achieved course objectives a course modified as necessary
5. Validate training	<ul style="list-style-type: none"> problem areas from 4. & 5. are identified by analyzing : <ul style="list-style-type: none"> * efficiency - whether best use was made of resources to achieve objectives * effectiveness - if skills & knowledge were increased * appropriateness - the relevance of the training received to the job training is modified or updated as necessary 	<ul style="list-style-type: none"> validated & successful training

6.2 Analyzing training needs

The objectives of the training needs analysis are to:

- describe allocated tasks;
- determine which tasks the personnel of an organization are capable of undertaking; and,
- determine which personnel require further training.

For any task there is a desirable level of skills and knowledge that will ensure the task will be performed correctly. Techniques for determining desirable levels of knowledge and skill may include:²⁵

- identification of competence required;
- vulnerability assessment;
- emergency planning;
- exercises; and,
- analysis of emergency operations.

Techniques for determining existing levels of knowledge and skill may include:²⁶ skills audit, exercises, and the analysis of emergency operations. A comparison between desirable and existing levels of knowledge and skill will indicate the training needs.

6.3 Designing training

Training should be based on training needs. To develop appropriate training it is necessary to develop **training objectives**, which should be mandatory, measurable, realistic and achievable. Training objectives describe the performance required in tasks, and therefore describe what a course participant should be able to do. For example, training objectives in an emergency management course may be:

‘at the end of this course participants will be able to:

- explain how to form an appropriate emergency planning group;
- lead a group in the identification of hazards;
- apply a number of methods for describing hazards, the community, and community vulnerability.’

Assessment can take a number of forms, such as:

- observation in the workplace by a supervisor;
- demonstration in a structured and practical manner;
- project-based assessment where a relevant project is undertaken on an unsupervised basis;
- simulation of the task including role play;
- structured tests (either written multiple-choice, short answer or extended answer, or oral); and,
- continual assessment of work-based performance.

6.4 Developing & conducting instruction

A **training or education plan** should be developed containing:

- summary of determined training and education objectives;
- program;
- allocation of responsibility;
- resource requirements;
- delivery modes; and,
- assessment, validation and evaluation processes.

6.5 Validating training

To validate training, instruments should be developed and implemented for:

Assessment - the measurement of an individual’s current knowledge, skills and competency, and is a baseline for measuring the effectiveness of training. Techniques may include practical assessment, on-the-job assessment and examination. Assessment can be performed before and after training.

Validation - the comparison between the outcomes achieved by training and education and the desired outcomes, hence the appropriateness of the training.

Evaluation - the process of determining the efficiency and effectiveness of a training and education plan. Part of the process is the comparison of outputs and objectives.

6.6 Public education

“The aim of public education is to ensure an alert and informed community. There is a requirement to have the community informed about the characteristics and possible effects of identified hazards. Public education material needs to contain action statements that will direct the public to make desired preparations and take appropriate actions. ... particular attention is given to identified special needs groups. A broad range of methods for dissemination should be considered, including:

- newspapers;
- radio;
- television;
- brochures;
- public meetings; and
- school visits.

It is also useful to advertise the existence of hazard analysis and emergency plans, and to place these on public view.”²⁷

See section 5.15 above for a description of how to develop and disseminate public information.

Summary

- Training and education of personnel in emergency management is required.
- A systematic approach to training will ensure that the training is appropriate, effective and efficient. This approach consists of:
 - * analyzing training need,
 - * designing training,
 - * developing instruction,
 - * conducting instruction, and
 - * validating training.
- Public education is necessary to ensure the community are aware of hazards and emergencies, and know what to do in case of emergency.

Chapter 7

Monitoring and evaluation

This chapter outlines processes and tools for determining the appropriateness, efficiency and effectiveness of emergency preparedness programs..

Monitoring and evaluation involves determining how well an emergency preparedness program is being developed and implemented, and what needs to be done to improve it. This method can be applied to:

- development and implementation of policy;
- vulnerability assessment;
- emergency planning;
- organizational preparedness;
- training and education.

Four ways for monitoring and evaluating preparedness will be described here:

- project management;
- operational debriefing;
- exercises; and,
- systems analysis.

7.1 Project management

The means of monitoring and evaluating during the implementation phase of a project include:

1. measuring the progress toward project objectives;
2. analysis to determine the cause of deviations in the project; and,
3. determining corrective actions.

Section 2.2 in Chapter outlines some of the techniques of project management.

7.2 Exercises

A common way of monitoring and evaluating parts of emergency preparedness programs is through conducting exercises. Exercises can be used to test aspects of emergency plans, emergency procedures, training, communications, etc.

There are many different types of exercise that can be conducted, each best suited for different purposes. The purpose of an exercise, and the aspect of emergency preparedness to be tested, must be carefully decided and fairly specific. An exercise should not be conducted with the purpose of testing an entire emergency plan, or all aspects of training. Some specific purposes for exercises related to communications include:

- to test the communications procedures contained within an organization's emergency procedures;
- to validate the inter-organization communications covered in a plan.
- to test the call-out procedures within an organization;

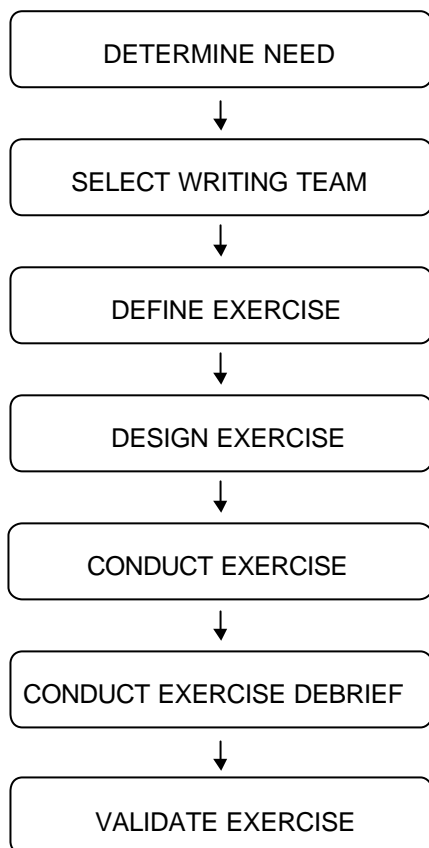
- to validate the lines of command and control defined under a plan;
- to test the ability of organizations to establish and maintain emergency operations centers; and,
- to test the response times of organizations involved in a plan.

Some typical types of exercise include:

- operational exercises - where personnel and resources are actually deployed in a simulation of an emergency;
- tabletop exercises - where personnel are presented with an unfolding scenario, asked what actions would be required, and how the actions would be implemented;
- syndicate exercises - where personnel are divided into syndicates to discuss and consider a given scenario, and the syndicate planning and response decisions are then discussed in an open forum.

One way to organize, conduct and review exercises is to go through the following steps.

Figure 11
An exercise development process



- Determine need - Exercises can be expensive and time-consuming, and sometimes dangerous - there must be a clear need for the exercise, and it must be targeted appropriately.
- Select exercise writing team to define and design the exercise. Some of the factors for selecting members of an exercise writing team include:
 - * at least one member should have some expertise in exercise writing;
 - * if a number of organizations are participating, each of the major organizations should be represented;
 - * members should have experience in the areas to be tested/validated; and,
 - * the chair of the writing team should be from the lead organization.
- Define exercise - This involves determining:
 - * the aim, objectives, and scope of the exercise;
 - * the authority for its conduct;
 - * the performance standards that will be used to judge the degree of success of the exercise;
 - * organizations to be involved;
 - * resources and budget; and,
 - * type of exercise.
- Design exercise - Exercise design involves

determining:

- * appropriate exercise scenario/s;
- * any special aids that may be required;
- * timelines;
- * exercise appointments;
- * exercise control; and,
- * safety requirements.

- Conduct exercise - In order to ensure effective exercise control, there will be a need to appoint exercise control personnel including:
 - * an exercise director;
 - * an exercise administrator;
 - * exercise umpires or directing staff; and,
 - * visitor/media liaison officer.

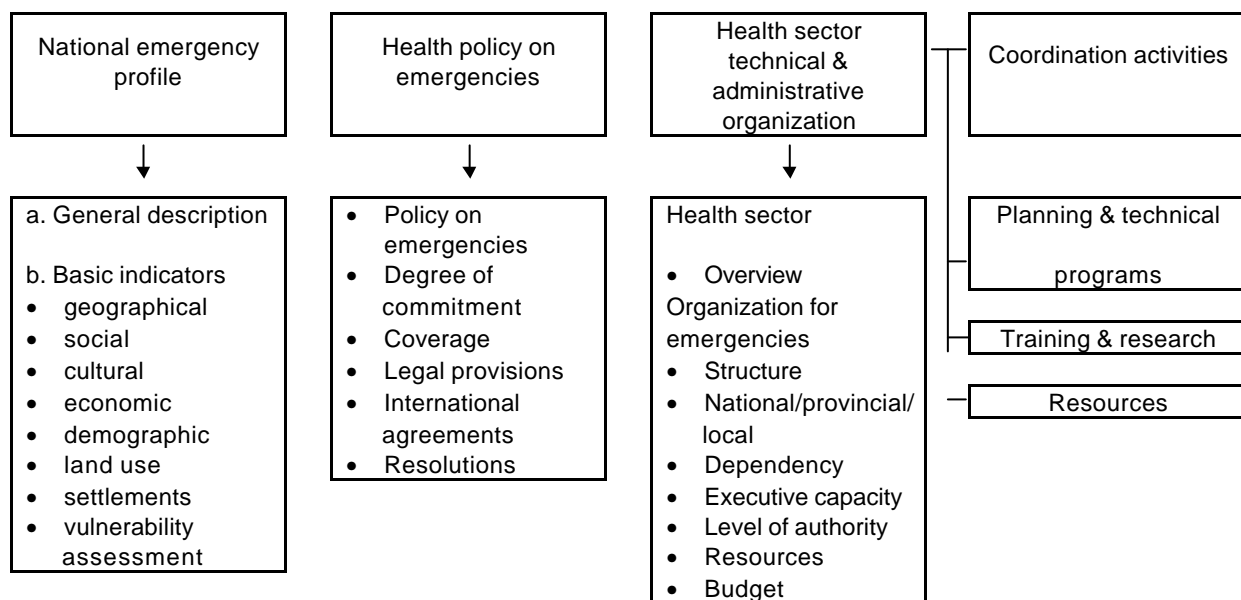
For operational exercises, the appointment of damage control officers, safety officers, and scenario coordinators may also be necessary.
- Conduct exercise debrief - The debrief should be a meeting of those involved in the exercise to consider, the degree of success in meeting the performance standards, and the success in achieving the objectives.
- Validate exercise - This involves determining how plans, procedures and training can be improved based on the results of the exercise.

7.3 System analysis of emergency preparedness

This method of assessing health sector emergency preparedness²⁸ systematically works through the various parts of a preparedness program. It searches for the existence of elements of the program which are assumed to be important, using objectives, checklists and key questions for each element. The national emergency profile and health policy are dealt with in general terms, whereas the element concerning technical and administrative organization is analyzed in greater detail.

Figure 12²⁹

A health sector emergency preparedness assessment process



Summary

- Monitoring and evaluation can ensure the appropriateness, effectiveness, and efficiency of emergency preparedness programs.
- Some means for monitoring and evaluation include:
 - * project management techniques,

- * exercising,
- * system analysis.

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