

**Assessing  
Resilience & Vulnerability:  
Principles, Strategies & Actions**

**Guidelines**

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These guidelines clearly derive part of their structure and some of their content from "Assessing Resilience and Vulnerability in the Context of Emergencies: Guidelines" written by Philip Buckle for the Department of Human Services, Victoria, Australia.

**Comments, suggestions and critical appraisal are encouraged and welcomed and should be directed to Philip Buckle at [philipbuckle@bigpond.com](mailto:philipbuckle@bigpond.com)**

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# PREAMBLE

When assessing the following guidelines we need to recognise that the manner in which they are interpreted and acted upon is dependent on the perception of 'risk'. When analysing one's susceptibility to risk and the level of resilience and vulnerability of members of a community we need to take the following into consideration:

- All of us are vulnerable when we are not aware of the risks that may be threatening us because we may fail to take precautions to minimise the risk. Or, we may deny that there is an actual risk in the first place and consequently also fail to take precautions.
- Understanding the manner in which 'risk' is perceived and that these perceptions will vary according to a person's knowledge of particular risks and the accuracy of detailed information available. All of us may be aware of a particular risk and realise what the potential consequences may be but we may be prepared to live with that risk. In other instances we are more concerned about other risks, perhaps overemphasising them to the neglect of the first or primary risk, which may have even more devastating potential consequences. People can underestimate 'risk' to their peril. People live with 'it' because the estimates are not precise or in the end, some risks are acceptable while others are not.
- Risks and their effects cannot be eliminated altogether so there will always be people who are 'at risk' with all of us potentially being vulnerable at some stages of our lives.
- Those to be found in the list of vulnerable categories may always be at risk no matter what efforts they make to minimise the effects of a particular event. They may also be the least likely to be able to limit the effects and the least likely to be aware of the effects in the first place.
- People also make many life-style choices, often determined by the accuracy of information available to them, which will have an impact on how seriously they treat a particular hazard. For example people may choose to live in high risk areas for aesthetic, environmental or accessibility reasons.
- People in landslip prone areas may choose the view and take the risk of a disaster occurring, perhaps assuming that the authorities would never have allowed the area to be developed in the first place if it wasn't safe. People living or moving to high-risk bush fire prone areas make similar lifestyle choices. In many cases, due to poverty, lack of knowledge, or other circumstances beyond their control people are impelled to live in a high-risk

area as they have limited choices available to them. They may not be able to afford to live anywhere but where the cheapest housing is.

- It may be that it's only when a risk becomes unacceptable to all, or most, citizens that they will act on minimising the risk, but that in many cases occurs after the event.
- Resilience and vulnerability are not static. For individuals and groups and communities they vary over time, and over space. As well, different people may be resilient or vulnerable in different ways. Resilience and vulnerability therefore need to be assessed in context.

These guidelines have been developed in conjunction with a number of agencies and municipalities and have been discussed with local people. Their comments and observations have been used to review and further develop this document.

We expect and hope that these guidelines will be useful and will continue to develop. We welcome assessment and comment on style, content, ease of use and distribution, indeed on any matter that can improve the use of these guidelines to agencies and communities in strengthening resilience and reducing vulnerability.

A note on definitions is needed at this point. By risk we mean a degree of exposure to a hazard where there is a potential for loss. Vulnerability is a propensity to suffer loss or damage and resilience is a capacity to withstand potential loss or to recover if loss or damage occur. For our purposes, and for most operational purposes these definitions are adequate and avoid pedantic debate.



# **INTRODUCTION AND GENERAL COMMENTS**

## **DEFINITIONS**

There are various definitions of resilience and vulnerability. This field is marked by a complexity of issues: which factors contribute to vulnerability and resilience, the social levels which may exhibit vulnerability and resilience, and the dynamic aspects of change over time, change from location to location and specificity to particular hazards.

Given this there is little value in a dogmatic adherence to a single definition. Instead, we accept that resilience is broadly the capacity of a group or organisation to withstand loss or damage or to recover from the impact of an emergency or disaster. Vulnerability is a broad measure of the susceptibility to suffer loss or damage.

The higher the resilience, the less likely damage may be, and the faster and more effective recovery is likely to be. Conversely, the higher the vulnerability, the more exposure there is to loss and damage.

## **INTENDED USERS**

These guidelines are directed at a range of audiences. We appreciate that not all of these will have similar needs and priorities. But we feel that the guidelines are sufficiently comprehensive to be able to inform emergency management at different levels.

We hope that at local level people and community groups will find something in these guidelines to assist them in assessing their own needs and capabilities.

At municipal and agency levels we expect that this document will be useful in evaluating community and constituent needs, assisting in planning and in critically reviewing the agencies' own capacities.

At regional, state and national levels these guidelines may be used to assist planning, to audit and evaluate subordinate plans and arrangements and to develop tools for policy and program development.

These guidelines we hope will be an evolving document. We hope also that they will stimulate debate and discussion between people, communities, agencies and governments.

In the end, however, they are a tool to be applied as seems appropriate in reducing vulnerability to disasters and emergencies and in generating increased resilience.

These guidelines, driven in part by the constraints of space, are aimed principally at assessing the resilience and vulnerability of individuals, small groups and small communities. The focus is on factors that are largely, though not exclusively, personal and social rather than economic, environmental, political or related to physical infrastructure. We would like to emphasise that resilience and vulnerability are “local” or “situational” but that they are influenced, often in very significant ways, by contextual factors such as those relating to economic, environmental, political and infrastructure conditions.

However, the principles, issues and methods we set out here can be applied, if used circumspectly, to all elements of contemporary society.

To understand risks and capabilities, resilience and vulnerability the entity being examined has to be seen in its environment.

Resilience and vulnerability are interactive, with each other, across social levels and across space and time. Assessment is therefore complex.

It is critical that the issue being investigated, or the indicator being used, is relevant and actually points to what the user intends it to. For example, the age or gender of a person will reveal only very general indications of potential resilience and vulnerability. To obtain a clearer and more useful picture of the resilience or vulnerability of a person or community it is necessary to understand the context in which the person lives or the community exists; then it is necessary to examine the specific circumstances of the person or community. For instance, all men may be vulnerable to particular risks, say motor vehicle accidents. But not all men will be equally vulnerable. Some men will be less vulnerable (they may not drive) some may be more vulnerable (they may be inexperienced drivers or aggressive road users). Some women may be more vulnerable than all or most men. Most women will be less vulnerable than most men. Not all women will be equally vulnerable.

Resilience and vulnerability are generated by complex interactions of many factors.

It is our view that predominant among the factors supporting resilience (or their absence setting the conditions for vulnerability) are:

- Access to resources and financial security
- Knowledge and skills (problem solving, decision making)

But, simply, when making an assessment it is critical to ask:

- I. Who or what is resilient or vulnerable

2. To what are they vulnerable or what are their strengths to resist loss (what are the specific elements of the hazard)
3. In what ways are they resilient
4. What time scales are involved

Resilience and vulnerability may be examined at a variety of levels including, but not limited to:

- The individual
- The family
- The group (such as sporting clubs)
- The street
- The neighbourhood
- The locality
- The community (as population within a given area)
- Demographic groups (such as age, gender, ethnicity)
- The municipality
- The region
- The state
- Nationally
- At system level
  - Economic
  - Political
  - Values and norms
- Infrastructure
- Services
- Environment

However in evaluating this list we must add another important caveat.

These guidelines are directed at non-structural assessment and management methods. They do not address structural measures to reduce vulnerability and to improve resilience.

This is due, largely, to the plain fact that much more attention has been given to mitigation of risk by structural measures than has been given to other methods.

We therefore want to redress the balance so far as we can.

However, we recognise that structural measures have an important part to play in managing risks. In many instances structural measures may be easiest to implement, cheaper, faster and more effective than other types of measures. Equally, structural measures can increase risk at a certain threshold of event, can distribute risks to areas where they would not otherwise occur and may generate risks of their own.

So any assessment of resilience and vulnerability and any evaluation must take account of potential structural and non-structural measures. These are complementary.

Structural measures are exemplified by such diverse activities as:

- Emergency service organisations
- Warning systems
- Dams
- Levees
- Retarding basis
- Building and design standards
- Land use planning and regulations
- Laws and regulations (directed at public safety)
- Population and activity relocation
- Fuel reduction burning
- Fuel clearing
- Planting of fire resistant species
- Fire breaks
- Zones of restricted activity
- Laws and regulations

## **A COLLABORATIVE APPROACH**

Resilience and vulnerability assessment is one aspect of community profiling and local emergency management planning.

These guidelines have been developed from an earlier set of guidelines prepared by the Department of Human Services Victoria. These guidelines were prepared following reviews of some major emergencies including the 1997 Dandenong Ranges Bushfires, the 1998 East Gippsland Floods and the 1998 Victorian Gas Crisis. Members of the Department, Victoria State Emergency Service, Local Government, specialist practitioners and others were involved in their preparation.

This document has built upon the early guidelines and gratefully acknowledges them. These current guidelines arise from an Emergency Management Australia funded project (15/2000) which examined resilience and vulnerability, particularly for individuals, groups and communities. A wide range of people, representing numerous distinct communities as well as a range of local, government and emergency management agencies were involved in an extended interview, discussion and consultation process for this project.

These guidelines should be considered in conjunction with that report which was the outcome of that project.

## HAZARD TYPES

These guidelines are intended to be used in assessing resilience and vulnerability in the context of emergencies and disasters; these terms are in practice synonymous.

Listed below are a number of hazards that may generate risks and in turn have a bearing on the resilience and vulnerability of people and their communities.

This is an indicative list only. It does not indicate all types of hazards and sources of risk. Not all of the phenomena on this list will fall into the disaster management arrangements in all jurisdictions.

- Fire
  - Wildfire
  - Building fire
- Floods
  - River flood
  - Dam collapse
  - Storm surge
- Storm
  - Cyclone
  - Windstorm
  - Hail
  - lightning
  - Tornado
- Landslip
- Earthquake
- Drought
- Land degradation
  - Erosion
  - Land salting
  - Desertification
- Epidemic disease
  - Human
  - Animal
  - Plant
- Utility disruption
  - Gas
  - Water
  - Power
  - Telecommunications
  - Sewage
- Infrastructure disruption
  - Roads
  - Bridges

- Dams
- Communications
- Essential services disruption
  - Hospitals
  - Police and security services
  - Emergency services
- Resource disruption
  - Food
  - Fuel
  - Pharmaceuticals
- Toxic chemical and radiological incidents
- Transport accidents
  - Road
  - Rail
  - Marine
  - Air
- Heatwave
- Financial institution collapse
- Major industry/service collapse
- Tsunami
- Major criminal activity
  - Bombings
  - Hostage taking
  - Mass shootings
  - Terrorist activity
- Any other disruptive event deemed to be critical to community safety and well being.

The terms emergency and disaster therefore cover a wide range of events, but generally refer to unexpected, socially disruptive and damaging incidents.

Resilience we take to be a measure of the capacity of a person, group, community or agency to withstand or recover from a disaster impact.

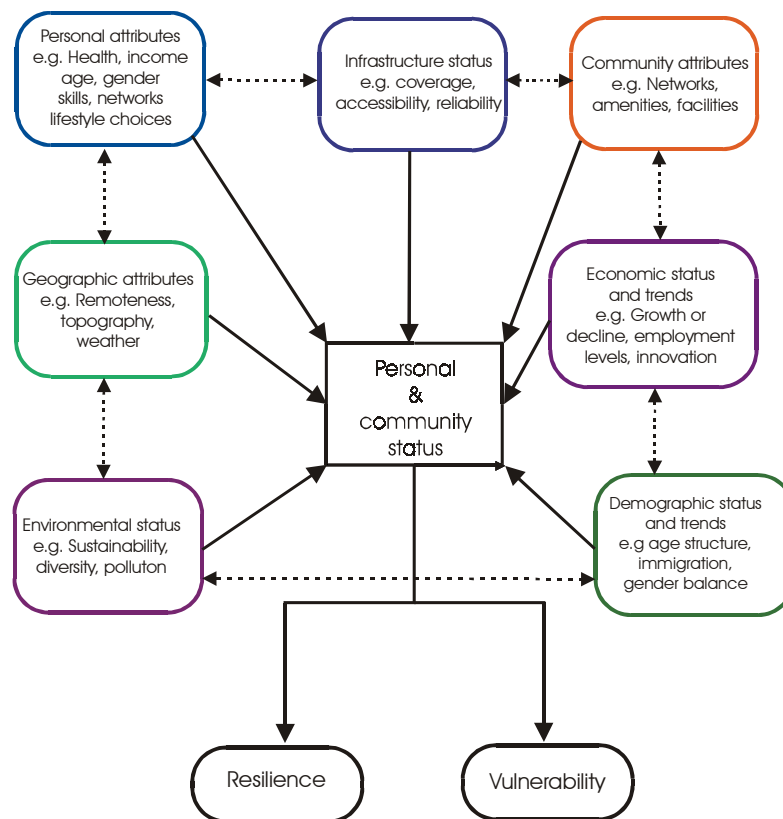
Vulnerability is a measure of the exposure of a person, group, community or agency to a hazard and indicates the type and severity of damage that is possible.

## **PURPOSE**

Understanding resilience and vulnerability is a key element of effective disaster management. These guidelines offer some alternative, but not exclusive, perspectives on evaluating, understanding and managing resilience and vulnerability

In particular this document aims to help in

1. Identifying the strengths of particular areas, communities or groups, in terms of resources, skills, networks and community agencies. These strengths and local capabilities may be used and further developed to minimise the negative consequences of an emergency. Prevention and preparedness activities, as well as recovery activities can be supported.
2. Identifying vulnerabilities of particular areas, communities or groups, so that these can be managed in terms of prevention and preparedness activities, response activities and recovery programs. By identifying risks and vulnerabilities prior to an event, local managers will have the opportunity to plan to avoid or to minimise the negative consequences of emergencies and disasters.



**Figure 1 Elements of resilience and vulnerability**

(indicative only)

These guidelines have been developed for local people, communities, local agencies, municipalities, government agencies and private sector bodies for use at any appropriate level.

By applying the principles and techniques in these guidelines it will be easier to:

1. Identify individuals, families, groups, communities, neighbourhoods, localities and systems that may be vulnerable to particular hazards or who may have particular strengths and capabilities
2. Plan for and meet needs that may arise after disasters
3. Plan to use and build upon local and system strengths and capacities.
4. Identify skills, expertise, knowledge, resources, networks and other capabilities that can be used to develop and sustain resilience.
5. Support local, agency, municipal, regional and State disaster planning and management processes.

It is important to note that vulnerability and resilience are attributes specific to a certain person, community or agency. They do not belong to groups of unrelated individuals.

Knowing that the elderly, let us say, are more vulnerable to bushfire is helpful in broadscale planning. But it does not tell us anything about the vulnerability or resilience of any particular individual. This has to be determined for each case.

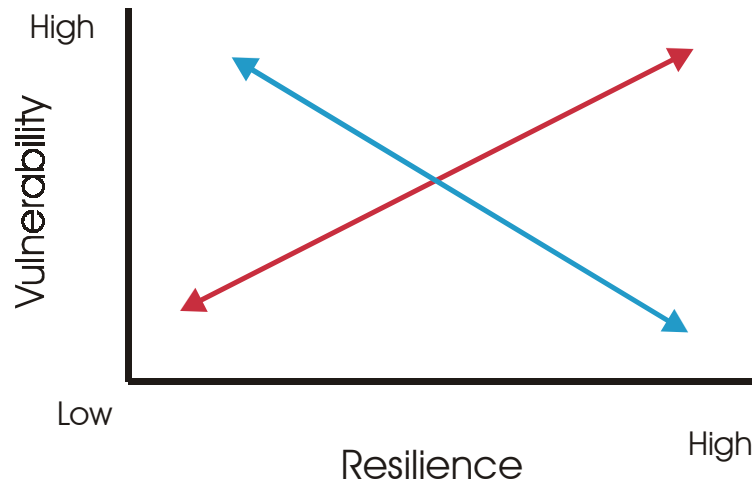
Of course generalisations and extrapolations can be made and these may be satisfactory for a particular matter or circumstance. But they are not specific assessments.

Equally, an area may demonstrate some particular aspects suggestive of the vulnerability or resilience of its residents, say remoteness from support services. But any particular person in that area may have easy access to services; for example they may own a plane to easily traverse long distances.

It is also important to understand that resilience and vulnerability are not necessarily opposite ends of a continuum for an individual, group or community.

A person, for instance, may be vulnerable to a particular loss, say flooding of their home, but they may have resilience in terms of being insured, having skills to repair damage or personal networks that provide them with emotional support. In this case their resilience is independent of the potential for loss or vulnerability.





**Figure 2 Resilience and vulnerability: (linked but not opposites)**

Resilience and vulnerability assessment is a necessary component of effective emergency management planning. However, it is unlikely that any assessment, or community audit, will capture every potential need or identify every person who, in some circumstance, may be exposed to a risk or to the possibility of some loss. After an emergency it will be necessary to scan the affected area, through information campaigns, outreach programs, letterbox drops and other methods, to identify people who require assistance.

Resilience and vulnerability analysis needs to be conducted with sensitivity and proper regard to people's privacy and their right not to provide information. There are also legal and other requirements to maintain proper standards of confidentiality when dealing with information from the public.

Each event is unique and will generate its own set of vulnerabilities. Each individual, family and community is different and may be vulnerable, or have resilience, in different ways. These lists are prompts to be applied with due regard for the complexity of our communities and the dynamic nature of emergencies and disasters. These lists may be used as a checklist to which you can add or subtract as is necessary, for the requirements of your community. Conducting a resilience and vulnerability analysis is not an end in itself. The purpose is to highlight issues, needs and concerns and to work to effect change — to improve resilience and/or to reduce vulnerability.

As part of this emergency management activity you might look at the renewal and development possibilities in an area. This applies particularly after an event, when it is important to move forward, rather than to simply try to repair the damage. Recovery may offer developmental opportunities that would otherwise not occur.

These guidelines are intended as an indication of the range and type of issues that need to be considered. As well some methods and resources are listed.

None of our lists or suggestions are necessarily complete. We recognised that competent people with sound experience, good intent, professional practice and skills in management and administration will be able to apply these qualities to resilience and vulnerability assessment.

Our concern therefore has been to suggest some perspectives on the broad area.

All assessment will depend on community, agency and government priorities, interests and capacities. All assessments will be more or less specific to a particular time, location and community.

# ASSESSING RESILIENCE AND VULNERABILITY

There are a number of different approaches to assessing and dealing with resilience and vulnerability. All have their own particular uses and limitations.

The approach we have adopted we refer to as the *functional* or *management focus* approach. In method we seek to identify those functional characteristics of an entity that can be dealt with in a practical way.

So, for example, there are common assessments of vulnerability that designate aged persons as being at particular risk. This has value in some mapping and policy development approaches. However, the limitation of this method is that we, as emergency managers, or community development workers or policy makers, can do little about old age (or youth, or gender or disability etc.). These are fixed characteristics.

But we can do something about the restrictions on mobility that often accompany ageing, we can draw on the knowledge and experience of the aged to inform program development, we can apply programmes to ensure that the aged receive information in ways with which they are comfortable.

There are, we believe, two goals in supporting resilience and reducing vulnerability.

The first, as an interim step, is to manage both, so that resilience does not diminish and vulnerability does not increase. This is, implicitly, the approach most often adopted.

This is management, not resolution.

The second step is to positively work to increase resilience and to positively reduce vulnerability.

This is problem solving.

The functional approach will be described in more detail later. Other approaches include:

## **Demographic analysis**

A commonly used method that seeks to identify classes of people at risk. Broad brush, but useful for developing generic policies and programs, but more specific assessment and applications development is still required

## **Hazard analysis**

Another commonly used approach that assesses the impacts of particular types of hazards. Useful in assessing risk at a location but it usually focuses on the hazard rather than its impacts on people and its social and economic consequences.

## **Area analysis**

This approach, not often used, looks at the whole range of risks and hazards for an area. This sometimes combines disparate elements and can be complex and hard to translate into effective policy and programmes but it gives a idea of the risks faced in a jurisdiction.

## **Time scale analysis**

This approach, using some of the methods above, analyses and describes risks, resilience and vulnerability as they unfold and develop over time. A variant of this is to look at the risks that attach to particular recurrent periods, such as climatic seasons or drought..

## **Needs analysis**

This approach can provide useful information linking risks, consequences and significant needs such as medical care, food, water, shelter, income security.

## **Political economy**

This approach looks at the broad trends (not at particular issues or actions) in the political and economic structure, life and values of a society. This is useful for identifying some contextual issues.

## **Capability analysis**

This approach, similar to our functional approach, looks at capacity (usually of communities) to provide support and services to members of the community.

Elements from all these approaches can be used to clarify issues and strategies to reduce vulnerability and to increase resilience.

The basis of any approach or method should include:

- Clarification of objectives and targeted outcomes
- Development of a framework of analysis and understanding
- Indication of data and information requirements
- Identification of personal and community needs
- Identification of developing policy options
- Indication of appropriate strategies and options
- Assistance in developing service and program standards and audit criteria

# RESILIENCE AND VULNERABILITY: PRINCIPLES AND ISSUES

## GENERAL

When considering individual, group and community issues, there is a set of principles that support resilience and reduce vulnerability.

The following list comprises broad categories of the types of assistance and support which individuals and groups may require in planning, preparedness, response and recovery. This is a way of thinking about service provision in management and operational terms rather than simply in terms of the particular assistance measure.

### Community Involvement

- The affected community will expect to contribute to their own preparedness and response capability, and especially their own recovery. If denied this opportunity, they may establish their own structures and processes to achieve that end. Supporting community involvement is therefore paramount. Successful management of the hazards, risks, impacts and consequences is not possible without community commitment and involvement.

### Information

- Information about risks and appropriate protective action
- Information and advice about support measures and how to access them, as well as eligibility conditions and application procedures.
- The normal bio-psychosocial reactions that can be expected and how people can deal with these reactions in themselves, members of their family and their community.
- Information about how to make sense of the event in terms of its cause and fitting it into their 'view' of the world.

### Resources

- Resources, advice, expertise, personnel, goods and funds available to support mitigation and safety measures
- Financial assistance for eligible parties to help restore losses. This may include grants, loans and insurance, where appropriate.
- Physical goods, such as temporary accommodation, essential household items, temporary public transport, tools and other items.

### Knowledge

- Understanding about the sources of risk
- Understanding about risk and hazard history

- Knowledge about appropriate behaviour in the face of hazards and risks

### **Management Capacity**

- Time and opportunity, for example, to undertake recovery activities.
- Physical capacity, which may include the support of other people, machinery or support where there is a particular need.
- Access to services, for example, through establishing transport systems, locating service centres close to affected areas or access to translators, interpreters or other language and media services.
- Expertise, for example, access to specialist services, such as tradesmen, financial counsellors and other professional services.

### **Support**

- Personal support, for example, outreach services, personal advisers and counsellors, specialist support services, advocates and gatekeepers.
- Community support, for example, community development officers.

### **Participation**

- Consultation in developing and implementing assistance and recovery programs.
- Encouragement in making a contribution to policy and program development.
- Engagement in monitoring and auditing the progress of recovery.

It is useful to set out community issues in these terms because it places them in a management and operational framework. Issues of resilience, vulnerability and need are expressed in terms in which they can be operationalised and dealt with in a practical way.

## WHO IS RESILIENT? WHO IS VULNERABLE?

Certain groups of people or certain communities or systems may have special needs after an event. There are groups that are traditionally accepted as being vulnerable. However, it is important to understand that the aged, for example, are not vulnerable because they are aged. They may be vulnerable *because* they have reduced mobility or have sensory impairments. These may be impediments that other younger people share.

Equally, some vulnerabilities may be countered in part by strengths and other capabilities. The aged, for instance, may have a greater life experience to draw from; experience in local issues or strategies; they may have a wide network of family and friends; they may have a personal strength drawn from many years of battling through life.

The groups listed below are generalisations. The list is not exhaustive; it attempts to broadly group areas of possible need. But more importantly, the list can be read as an indication that there may be a potential need or vulnerability that should be addressed in emergency management planning.

This list is also directed at individuals or small groups. There may be larger socio-economic categories or groups whose potential or actual strengths and weaknesses should be assessed.

Farmers, small businesses, local groups or associations may all have special and significant needs that separate them in some clear way from other members of their community.

Equally, communities and agencies may be vulnerable to loss and damage from emergencies. A similar process of assessing elements of vulnerability and resilience and evaluating capability can be undertaken for communities and agencies.

It is important to note that these categories are not fixed. Provision of resources, funding, social support, training and education will enable many people, if not most, to adequately manage their own affairs. The goal, eventually, is to develop a sufficiently high level of resilience and coping capacity so that the disaster support mechanisms no longer exist.

# DEMOGRAPHIC GROUPS

## **The Entire Population**

Everyone is vulnerable in one way or another to some loss. Even the wealthy may be vulnerable to loss of irreplaceable memorabilia, emotional or psychological loss. Even though they have the resources to easily replace material losses. Equally, most people will have some degree of resilience, some coping capacity, some resources or networks or support services to draw upon.

## **The aged (particularly the frail)**

In terms of mobility and physical capacity. In turn this may reduce their capacity to access information or to appreciate the urgency of certain situations

## **Babies, infants and young children**

In terms of managing their own lives and recovery and in terms of understanding the event.

## **Adolescents and Youths**

Young adults may have special needs given the demands made on them by the transition into the adult world and the requirements of education and other personal development matters.

## **Gender**

Different genders may have varying skills and needs. These are often counterintuitive and need to be assessed in the circumstances. Stereotypes should be avoided.

## **The disabled (intellectual, psychiatric, and physical)**

In terms of managing their own recovery and in getting access to information and resources.

## **People with limited resources to meet essential daily needs**

In terms of having the financial and physical resources to achieve recovery or to protect themselves against loss through, for example, insurance.

## **Non-English Speakers (NESB)**

In terms of understanding the potential risks and in gaining access to information and of communicating their needs.

## **The socially isolated**

In terms of having family or friends that can provide personal and physical support and in terms of accessing information and support

## **The physically isolated**

In terms of having easy, cheap and fast access to resources, or in terms of being able to call on assistance from other members of the community or from agencies.



### **The seriously ill**

In terms of already being in need and having a very low capacity to carry out protective or recovery activity.

### **People dependent on technology-based life support systems**

In terms of being dependent on systems over which they have no control.

### **Large families**

In terms of complex family needs and dynamics and increased costs for prevention and recovery; these needs may be offset by the extra support that a large family can offer.

### **Single parent families**

In terms of having to manage a range of demands with limited support.

### **Workers at risk from machinery or equipment failure**

In terms of potential severity of injury. also failure of machinery may have downstream effects, such as job losses

### **People with limited coping capacity**

In terms of low or reduced capacity to manage life events. Many people are able to cope with and to manage daily life. But any new or additional disruption or burden may push them across a threshold from where they are unable to deal with either the new situation or their previous needs.

People with limited personal capacity to deal with stress and disruption, with limited economic resources or who have previously experienced significant stress, trauma or loss in their lives. This group may already be on the margins of successful life management or day-to-day coping with loss, damage or threat to life, safety, property or income caused by an emergency or disaster, and the new disaster may disrupt them even more.

### **People with limited management skills**

People with limited skills in management, decision-making and resource acquisition may find it difficult to manage their needs, even if they have adequate physical and financial resources.

### **People with inadequate accommodation.**

People already in straitened circumstances and with existing high levels of need and support.

### **Tourists and travellers**

In terms of being absent from their own communities and resources and being in an unfamiliar environment; possibly with little knowledge of how to access resources and services.

### **New arrivals to the country**

May have limited understanding of local services, laws and values. They are likely to have restricted support networks and may require specialist support with language and social support services.+

### **People affected by an emergency**

In terms of needs (medical, psychological, material, etc) generated by the event.

In this list we have indicated a range (but not necessarily the full range) of groups that may have particular needs. It is important to remember that any person may belong to a number of these cohorts. That families will contain members with different needs and strengths and that communities (especially those based on area) are characterised often by diversity in detail as much as by homogeneity and commonality.

## **COMMUNITIES**

Community is notoriously hard to define, but we mean by this term any group of people living in a defined area or any group of people with shared interests (such as occupation or gender) or sharing a common characteristic (such as age or gender).

Communities consist in their visible part of communally used and shared infrastructure such as halls, churches, recreation grounds as well as pubs, shops and other communally used and or owned infrastructure. Communities also consist of shared and common activities such as festivals, sporting events and they consist of shared personal and information exchange networks.

All of these can be damaged by disasters; either physically damaged in the case of buildings and other physical infrastructure or damaged functionally in the case of networks and systems and processes in terms of their efficiency in mediating news, information and social bonding.

## **AGENCIES**

Agencies may be Government agencies and bodies (municipal, state and Commonwealth), not for profit or non-government organizations or even private sector enterprises. Where an agency is impacted it is less able or even unable to fulfil its mission to support local people.

Impacts on agency staff, as members of the community, may also reduce agency effectiveness.

# INFRASTRUCTURE

Infrastructure comprising roads, bridges, telecommunications equipment and other physical or mechanical equipment can be physically damaged by disasters. In turn this can reduce community amenities and make the daily life more difficult as well as, in some cases, constituting a safety risk.

The social significance of infrastructure has to be assessed. Infrastructure does not exist in its' own right but has value and importance only so far as it meets human and social needs.

# SYSTEMS

Systems we take to be any process of exchange or communication and we include environmental systems, economic systems, transport systems, systems of value and ethics. These may include constituent physical components, such as farms and businesses and roads, but systems exist at a more abstract level. When the constituent components of a system are damaged or destroyed this may impair the functioning of the system itself. In turn damage to a part may be communicated to other parts. For example, if farms are damaged by flood and the farm income reduced this can communicate itself in turn into reduced business for the shops and car dealers and entertainment centres of nearby towns.

Systems may include:

- Physical systems
  - Transport
  - Communications
- Values and Belief Systems
  - Values
  - Norms
  - Traditions
- Environmental systems
  - Plants
  - Water
  - Atmosphere
  - Soil
  - Animals
- Farming or other land use systems
- Exchange and transfer systems
  - Economic systems

- Information exchange systems and networks
- Social and community networks

## **STRUCTURAL ISSUES**

So far we have focussed on the potential for loss or damage at local levels and assessed in terms of a narrow “situation”.

However, most communities are influenced directly and indirectly by their context. Below we have listed some contextual issues we consider important in assessing resilience and vulnerability.

Structural changes may work over long time periods and are part of the way in which societies evolve, develop and change.

Modifying structural issues can be extremely difficult and the outcomes not certain, especially as matters other than disaster resilience and vulnerability may be influenced by these broad scale issues.

But emergency management agencies, communities and governments need to be aware of relevant structural issues and trends to ensure that plans and arrangements are current with and adapt to a changing society.

### **Change and Development**

Change and development in an area or to a community may be positive or negative. Generally it seems positive change and development (such as economic growth, rising incomes and improving environmental quality) supports resilience and reduces vulnerability. Decline on the other hand may engender and foster vulnerability. Where a community is ageing, where unemployment is rising, businesses declining, infrastructure becoming worn, then vulnerability may be increased.

However, in times of crisis any change, either positive or negative, may impact adversely on individuals and communities. In times of loss, stress and efforts at restoration any change, as deviation away from the known and the stable, may add further uncertainty to peoples lives. Change may also make managing support services and programs more difficult.

### **Exclusion**

Exclusion is a term that refers not just to disadvantage and lack of resources but also to the lack of access to information, skills and amenities. Exclusion may not be deliberate or even something of which people are consciously aware. Where people and communities are lacking adequate resources, find it hard to access information, do not have direct access to agencies and governments, lack skills in political lobbying, decisions making, management and coordination then the process of community

emergency management, and of mutual personal and group support, becomes much more difficult.

Exclusion may occur as a result of distance from services and hub activities, such as municipal centres, access difficulties derived from language, ethnicity or genders, unemployment or other causes of low incomes (and therefore few resources).

### **Social and Demographic Trends**

Change in the population of a community, through growth or decline of population numbers, changes to ethnic groups or to the relative proportion of age groups or gender groups, can all impact on resilience and vulnerability. The exact nature of the changes may only be assessable in a specific context and in relation to certain hazards or risks.

Changes may also be both positive and negative. An ageing population for instance, may reduce the number of able-bodied adults for community safety work but increases the pool of experience and expertise.

Awareness of the directions in which a community is moving and changing is essential if plans and management arrangements, mitigation measures and recovery support programmes, are to be developed and maintained in ways which are optimally relevant to the community.

### **Economic conditions**

Economic conditions and relationships and trends can have a direct bearing on community resilience and vulnerability. Growth and expansion will generally promote resilience, where the benefits are shared across the community and where growth does not cause damage to some other system, such as the environment.

Economic conditions refer to more than growth or decline. It addresses also issues of access to wealth and income, issues of income security and economic stability as well as “community”; wealth to ensure that there is sufficient surplus in agency and government budgets to fund mitigation, response and recovery programmes.

### **Environmental conditions and status**

The environment, meaning the state of well-being and sustainability of natural ecosystems, plants and animal species, is critical to community well being. As a source of recreation and leisure, as a spiritual resource as well as contributing economic and scientific resources the health and sustainability of natural systems are woven into the cloth of soil and economic life.

Environmental conditions that are not sustainable, through damage or over use or inappropriate use, will probably reduce the quality of life as well as economic opportunities for local communities. As well, damage to or degradation of environmental sub-systems, such as plant systems, water systems, species diversity, soil

quality, will impact on community viability and sustainability.

### Changes to Vulnerabilities and Resilience

It is important to understand and include in the vulnerability assessment the appreciation that resilience and vulnerabilities and needs may change over time.

Needs may differ significantly (in terms of numbers of people and the urgency of the need) between those which occur a few hours after impact, and those which emerge after days or weeks. For example, the loss of water supply may be trivial for an hour or two, but over an extended period it has the potential to affect the whole population in a critical way. In this case vulnerability will also depend on temperature, humidity and personal characteristics.

The time of year and weather conditions may also be an important factor in assessing vulnerability. Loss of heating in summer is less significant than it is in winter. Loss of refrigeration in winter may be less important than in summer.

Once a vulnerability assessment has been undertaken the results should identify special needs that can be directly addressed as part of the local emergency management planning and community support processes. The results of these assessments should contribute directly to the of planning, prevention and preparedness processes. It may be necessary to make this type of information available to individuals, groups, communities and agencies to assist them with their local activity.

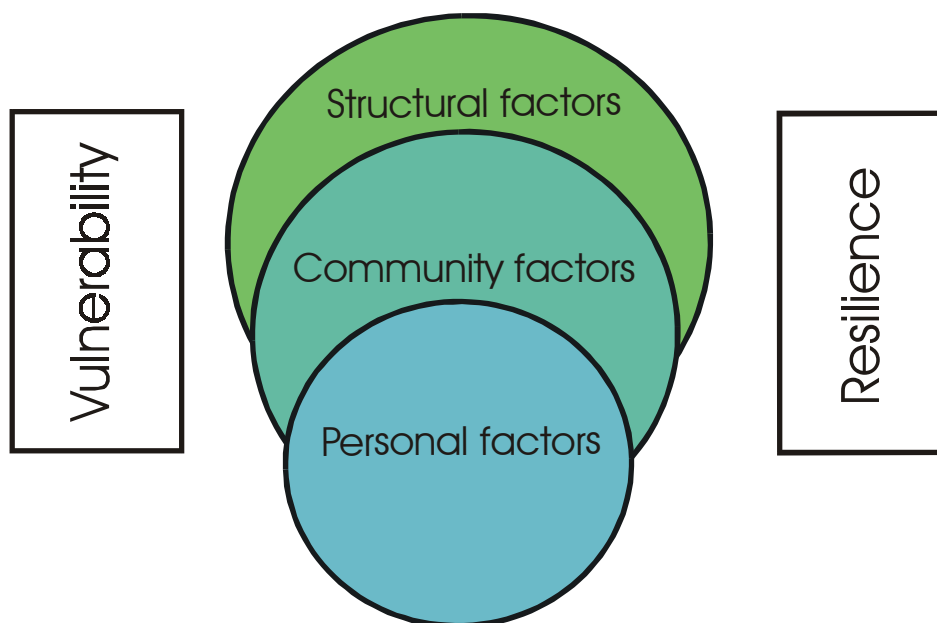


figure 3 levels of resilience and vulnerability

# LOSS, DAMAGE AND NEEDS

The list below suggests some of the key areas in which damage can be caused by disasters and emergencies and, as a consequence, the types of needs that may be generated among the population.

## **Sustaining life**

Essential medical facilities, medical and health care staff, medical equipment and 'hospital in the home', medicines.

## **Sustaining physical well-being**

Accommodation, food, water, clothing.

## **Sustaining mental well-being**

Personal and psychological support and information, social networks and established relationships.

## **Reducing social isolation**

Access to support networks as well as information and resources.

## **Reducing physical isolation**

Access to facilities as well as information and resources.

## **Supporting emergency staff**

Supporting staff whose job is to provide urgent, critical support to others.

## **Supporting people who have few resources**

Access to financial and resource supplementation.

## **Assisting people who have resources adequate to manage their own recovery**

Even people who have resources to manage day to day needs may require additional assistance after a disaster such as access to non-financial or non-material assistance and support.

Using a more descriptive method, focussing on the need specifically rather than the management issues needs may include:

While there are wide variations in the types of risks and losses which individuals, groups and communities may be exposed to; the following list indicates the common types of potential losses and damage. These include:

## **Safety**

Threats to life, the possibility of injury or other losses of physical security.

**Home/Shelter**

Threats to safe, appropriate accommodation.

**Health/Well-being**

Threats to short to long-term well being, in terms of physical health and psychological and emotional well-being.

**Values, Beliefs and Ethics**

Challenges to local values, norms and behaviours and ways of people. Values, morale and shared views and opinions need to be sustained so far as they are positive and bind the community together.interacting with other

**Food**

Threats to an sufficient and nutritious and uncontaminated food supply.

**Water**

Threats to adequate and uncontaminated water supply.

**Resources and Materials**

Loss of resources, materials and goods (such as petrol) necessary to maintain a safe, normal day-to-day life.

**Sewage and Waste Disposal**

Threats to a continued safe disposal of waste and an avoidance of environmental health risks.

**Social links**

Threats to the networks and links which sustain daily community life, which provide a sense of order and meaning and which allow access to support and services.

**Information**

Threats to sources or outlets of information about existing or emergency management services and to available information about support and assistance measures

**Access**

Threats to transport systems and utilities as well as to physical infrastructure, such as roads and bridges.

**Income/economic opportunity**

Threats to the capacity to earn a livelihood through the loss of employment, loss of customers or the loss of assets; and through this threats to well-being and the supply of staple goods.



# CAPABILITY ASSESSMENT: RESILIENCE AND VULNERABILITY

The hazard agent itself will influence vulnerability and resilience. It will, in part, dictate appropriate preventative measures, as well as the types of losses and needs which may occur, and therefore the types of assistance and support measures that may be required by individuals and the community. There is no precise way to define in advance whether a particular event will be a disaster or emergency. This will require professional judgment at the time and will have to take into account factors such as:

- The severity of the loss suffered by the community and
- The capacity of the community to support itself and to manage its own recovery.

## RECENT HAZARD EVENTS

The types of events which the emergency management system has dealt with in recent years include:

- Floods
- Cyclones
- Tornadoes
- Bushfires
- Storms
- Road accidents
- Criminal shootings
- Murders
- Bombings
- Lightning strikes
- Landslip
- Human disease
- Utility disruption
- Financial institution collapse
- Child abuse (where it has affected many families in a small, localised community over a long period)
- Public health issues
- Animal disease
- Drought and other environmental problems that require personal and community support.

## **ASSESSING THE HAZARD**

Hazards are composed of a set of factors that describe their important characteristics and which may be assessed to determine the potential severity of the hazard agent. The list below describes significant elements.

### **Predictability**

Can the timing or location of the event be predicted (to allow prevention activities or protective action)? Is it seasonal, or confined to one area?

### **Speed of onset**

How much warning will there be? How much time is available to move people and property to safety?

### **Destructiveness**

How destructive is the hazard? How much of a threat of death and injury does it pose?

### **Duration**

For how long will the hazard persist?

### **Frequency**

How often does the hazard occur?

### **Area or Extent**

How much area will be affected? Will there be an area from which other resources and support can be drawn?

### **Number of people affected**

How many people will be affected?

### **Assistance**

What assistance will be required if the event occurs? What opportunities are there for self-protection, such as insurance?

## **ASSESSING THE IMPACT**

Impact assessment follows from hazard and vulnerability assessment, but tries as soon as possible after an event to obtain a snapshot of needs and capabilities. This snapshot should be repeated, updated and monitored, as regularly as possible.

### **Type of Damage, Loss and Injury**

An assessment needs to be made of the quantity and type of loss. Losses may include deaths, injuries, property damage (which can be sub-divide into categories such as

homes and income earning assets), damage to social and community networks and systems as well as to physical infrastructure, communications systems and services.

### **Needs Assessment**

Following from a description and evaluation of damage there will be a requirement to identify, and to prioritise needs of individuals, families, groups, communities and service providers.

Needs are related also to damage to service provision capacity.

Needs should be mapped against service capability.

Needs will include day-to-day and continuing service, support and welfare requirements.

### **Pre-existing circumstances**

Disasters do not occur in a vacuum and communities do not exist separately from their environment. Pre-existing conditions, including structural issues and long term trends, will all bear upon the severity of impact, individual and community needs and appropriate responses.

Pre-existing circumstances may be positive or negative and may include economic conditions, population characteristics, community characteristics, environmental well-being status, economic conditions as well as constraints imposed or opportunities offered by geography, political conditions and other broad area states.

### **Proportion of Damaged to Undamaged Resources and Facilities**

The capacity of local people and local communities and of agencies to maintain normal services and to provide additional support to their members and staff will depend in part on the proportion and type of damage.

### **Damage to Critical Facilities and Public Utilities**

Facilities that are critical to effective support will depend on the type of disaster and the period elapsed since impact. Generally critical facilities will include hospitals, emergency services organisations, police, government, health care.

### **Resources**

Resources may include plant and equipment, transport and communications systems, staff, offices and management facilities, funding. Less tangible resources may include skills, knowledge and experience. These may themselves be damaged. The extent of resource supplementation will depend on a number of factors including the type and extent of damage, remaining resources, needs and local conditions (such as remoteness, topography and climate)

## Plans and Arrangements

Plans and arrangements may not guarantee effective or easy disaster management, but their absence may guarantee significant operational and management difficulty. Plans and arrangements therefore need to be in place, agreed, understood and tested before an event occurs.

Plans need to be flexible in dealing with changing circumstances as the event unfolds and adaptive in terms of dealing with unanticipated development.

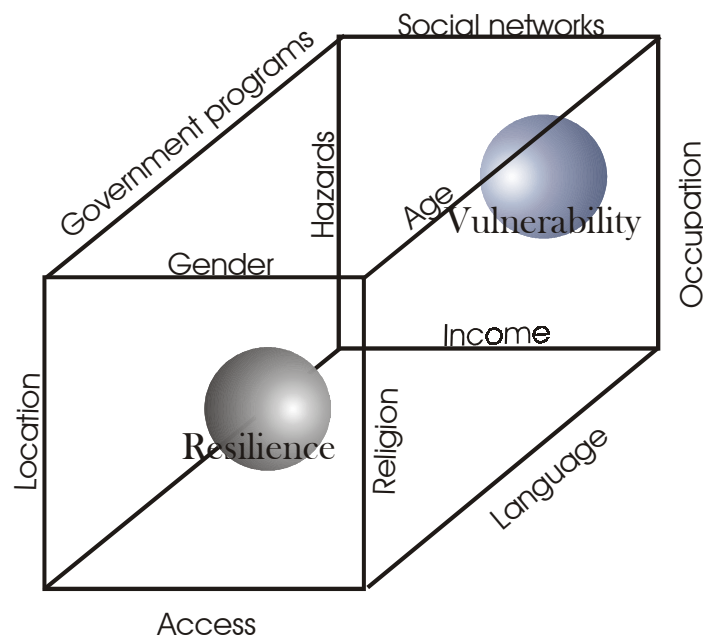


Figure 4 Resilience and vulnerability: variable states

# RESOURCES FOR PLANNING AND ASSESSMENT

There is a range of sources available for information about the demographic, socio-economic and other aspects of community life and structure. Not all these data sources will be equally useful. Some may become dated, and some agencies may charge for access to information, and others may apply be confidentiality restrictions.

## LOCAL INFORMATION SOURCES

- Municipal surveys for planning and development purposes.
- Surveys and other research by specific agencies, such as General Practitioners, hospitals.
- Commercial and farming associations, such as business associations and the Farmers' Federations.
- Agencies, for example:
  - Police
  - Schools
  - Fire services
  - Volunteer fire-fighters
  - Meals on Wheels
  - State Emergency Services
  - Human Services
  - Hospitals
  - Supported accommodation and other service providers
  - Royal District Nursing Service
  - Infant Welfare Centres
  - Ethnic and Koori Support Agencies
  - Community Health Centres
  - Community Mental Health Centres
  - Churches and other religious bodies.
  - Personal and disability support services
  - Income support agencies
  - Local media
  - Libraries
  - Government agencies such as Natural resources and Environment agencies
- Storekeepers and publicans
- School teachers.
- Community leaders and Community elders
- Real estate Agents
- Banks
- Doctors and other health and welfare professionals

## Data Sources

- Home and Community Care databases
- Meals on Wheels databases.
- People at risk registers held by hospitals and utility companies
- Municipal community services registers
- Municipal emergency management plans
- Hospitals
- Utility Companies
  - People with special needs, such as life support systems, may be registered with utility companies.
- Human Service Agencies
  - Human service, income support and welfare agencies should have information on available standard support measures as well as measures available to support individuals and communities after disasters.
- Australian Bureau of Statistics
  - Census data
    - 1996 census data. This is available down to collector district level that typically comprises a small number of houses.
- Community profiles
  - These are available for a range of areas including municipalities, postal areas and suburbs. Information includes language spoken at home, ethnicity, religion, dwelling structure and education.
- Economic, Social and Environmental trends and status
  - Data is available which indicates growth, decline or change from year to year across a wide range of matters.
- Socio-economic Indexes for Areas (SEIFA)
  - There are five indexes that summarise the relative socio-economic conditions of an area (these allow comparison of areas).
    - Urban index of advantage
    - Rural index of advantage
    - Index of disadvantage
    - Index of economic resources
    - Index of education and occupation.
- Australian Council of Social Service (ACOSS)
  - ACOSS and its state counterparts have information on a wide range of groups of people with particular needs and an equally wide range of services that may be available.
- State Community Information Centres
  - Information may be available on a wide range of issues including demographic matters and community resources
- Disability Resources Centres
  - Information is available on groups with particular needs
- Ethnic Communities Councils
  - Information on ethnic communities and language groups

# ASSESSMENT METHODS

Resilience and vulnerability can be conducted by communities, municipalities and agencies and may occur at different scales and levels of resolution. Increasing generality and breadth of view may complement detailed studies and assessment by identifying structural and contextual issues, indicating trends and patterns of change and providing the social, economic and environmental context for the detailed, local assessment.

## SETTING A FRAMEWORK FOR ASSESSMENT

A goal is to investigate the local situation and to then place this in a strategic context.

When beginning a process to assess resilience and vulnerability it is important to establish a framework for the assessment. A first step in this will be to decide upon the elements to be examined. Typically these will include at least the following:

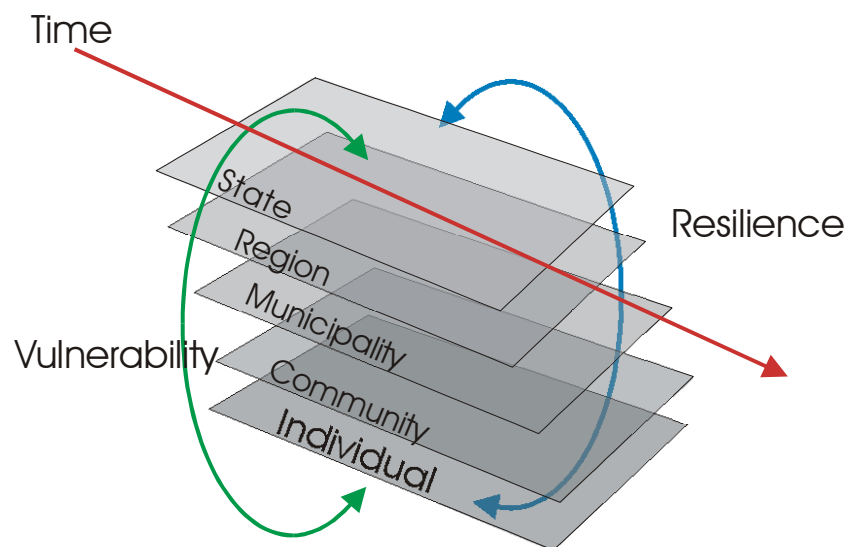


Figure 5 Resilience and vulnerability (Inter-linked across levels)

### Hazard

Although many hazard impacts result in similar consequences, such as injury and the loss of residence, there may be differences between them. Bushfires, for example, usually offer less warning time than floods and may totally destroy houses. Floods, however, cause damage but are unlikely to result in the total loss of a residence.

### Locality

Each locality has unique characteristics and may have vulnerabilities and strengths in a different combination to others. It is therefore important to clearly define the area being assessed.

## **Scale**

The size of the area chosen is also important. A large area may combine smaller areas that have little in common and will therefore skew results if aggregated data is used. Scale also applies to the level of aggregation of data — that is, the extent to which it may be useful to generalise about an area.

## **Demographics**

An analysis may be undertaken for a particular group within a given area. The results of this analysis will be useful only for that group of people.

# **DATA SOURCES**

The next step will require identification and agreement on the sources of data and the methods used to acquire information.

These can include:

## **Local Experts**

Discussions with people who are prominent in community affairs can frequently give special insights. Such people include police, doctors, SES personnel, municipal personnel, RDNS nurses and Meals on Wheels providers. This is a cheap method to gain special insights.

## **Focus Groups**

Groups from the community, people with special interests or expertise or community leaders can meet to discuss and assess issues of vulnerability and resilience. This method often yields insights but is not particularly rigorous and will not identify all needs in a thorough way. This process is not time consuming, is relatively cheap and is useful in scoping a locality or large area.

## **Census Data**

Census data can be a powerful tool for identifying the special characteristics of areas down to a few hundred houses. It can be conducted quickly and relatively cheaply. However, the data gradually becomes dated and will only give a picture of an area but does not identify individuals or small groups.

## **Surveys**

Surveys requesting data may be distributed to residents. This is expensive and time consuming but gathers a lot of information. However, it is still likely that it will not identify all people in possible need.

## **Questionnaires**

Distributed with service providers, such as Meals on Wheels or RDNS nurses, this method also collects a lot of data but is expensive and time consuming.



## **Outreach Programs**

Post event outreach programs are a very useful technique for identifying losses and needs. Properly organised, this can be conducted quickly and efficiently.

## **Group Surveys**

Surveys, discussions or questionnaires to social groups, such as sporting clubs, Country Women's Association, residents' associations professional and commercial associations, such as chambers of commerce, service clubs and farmers' associations can provide useful snapshots of an area and a community.

## **Historical Records**

Records of past community life may reveal useful information about community structure, contemporary attitudes, previous hazard exposure and local responses to those hazards. Historical records can include government and municipal records, memoirs, historical research, newspaper records and records of local community groups. Many municipal libraries and local historical societies will possess useful information.

## **Maps**

Maps and other images of relevant entities such as demographic groups, hazard occurrence and infrastructure are invaluable tools in assessing local resilience and vulnerability. Maps may also be used to generate visualisations of data (ranging from simple graphs to more complex graphics) that are useful for a quickly understood snapshot of key issues.

It is important to remember the following cautionary points:

- No set of data is likely to be complete or to meet all information requirements of the assessment
- All data needs to be kept up to date.
- Information is most useful when shared.
- The tasks of the assessment process can be shared between groups, agencies and communities.
- Engaging a range of people and groups in the assessment process will usually be positive and strongly advantageous

# INCREASING RESILIENCE AND REDUCING VULNERABILITY

There are a number of factors that help individuals, families, groups, communities and agencies to prevent and minimise the consequences of disasters. These include supporting both preparedness activities and sustaining recovery activities.

Identifying and assessing positive factors that support resilience gives emergency planners and managers the opportunity to increase the 'disaster resistance' of the population.

This section does not refer specifically to pre-event or post-event actions that may be taken to strengthen resilience and reduce vulnerability. This is intentional as we see prevention, response and recovery as linked and networked. Actions taken for one activity may benefit other activities.

Nor have we addressed physical prevention and mitigation measures. These are important but are dealt with in technical detail in many other documents. Our focus is on the social side of resilience and vulnerability management.

## **Community capability**

Enhancing management and problem solving skills, knowledge, expertise and access to resources within communities, and particularly in community groups, can benefit both communities and individuals. Additional skills and resources can develop and supplement community capacity to manage affairs at the community level and to provide mutual support to individual members.

## **Suitable physical infrastructure**

Infrastructure by which is meant physical infrastructure such as roads and bridges as well as communication systems, transport systems is essential for the proper functioning of a community. Assessing potential damage (vulnerability) to infrastructure should be a part of any resilience and vulnerability assessment. Suitable infrastructure means quality in terms of safety, useability and durability as well as quantity and being in appropriate places.

## **Suitable service infrastructure**

By service infrastructure we mean locally based services such as schools, health care services, advisory services and transport services, as well as private sector services such as banks, shopping centres and recreation centres. These are imperative to ensure that people have the resources and goods to produce their own support arrangements.

### **Established social infrastructure**

This includes information channels, social networks and community organisations, such as sporting and social clubs. Social facilities and processes can, to some extent, be planned and developed to provide greater community support. Through training and awareness raising they can be made more resilient to disaster impacts.

### **Local plans and arrangements**

It should be unnecessary to say that in the face of hazards and risks it is important to have plans and arrangements to mitigate, respond to and recover from emergencies and disasters. These plans, which should be prepared at least at municipal and agency level, but may also be developed for special sites, communities or areas, should be developed in conjunction with the appropriate emergency service organisations. Plans should be comprehensive and up to date.

### **Local engagement**

Local engagement in planning, preparedness and management should be encouraged. It offers local people ownership of the arrangements, draws upon their knowledge and skills, and acknowledges their priorities and values. Care should be taken that the burden of local commitment does not fall repeatedly and exclusively on the same volunteers and community leaders.

### **Supporting trends**

Positive trends of growth and learning that contribute to community strength and cohesion can be identified and may, through large agencies, municipalities or communities, be supported and encouraged. This provides positive feedback

### **Shared community values, aspirations and goals**

This includes a shared and positive sense of the future, a commitment to the community as a whole and agreement of community goals as well as a shared culture. Shared visions and agreed outcomes can be developed and encouraged through information exchange and community development processes.

### **Appropriate and adequate resources**

This includes access to funding support from agencies but refers also to infrastructure described above and also to community leadership, practical and professional skills shared by community members.

### **Positive social and economic trends**

This includes a stable or growing population, a healthy economic base. Local, municipal and regional development plans may be constructed and applied to nurture particular trends, projects and programmes and to minimise negative trends.

### **Sustainability of social and economic life**

This includes a capacity for the community to weather disruption. Sustainability implies the development of processes, arrangements and states that are more or less self-

reliant and self-maintaining.

### **Partnerships**

Partnerships between agencies, between community groups and between commercial enterprises (and any combination of these) may bring innovation, sharing of experience, knowledge and resources and common goals. This applies particularly where the partners play a dominant role in the social and economic life of the area, such as towns dominated by a particular industry or economic activity.

### **Communities of interest**

This exists where a group covers a wide area and is otherwise socially diverse, but still shares a common area of interest, skill or expertise. This includes communities bound together by faith and religious commitment as well as less formal groups, such as business or commercial associations or sporting or recreational clubs.

### **Established networks**

Clear and agreed and stable links between people and groups facilitate the exchange of information as well as the sharing of resources and the commitment of skills, time and effort to planning and preparedness.

### **Resources**

The resources and skills available locally may be directly relevant to emergency management planning, preparedness and for community support if an emergency does occur. These can be identified by the type of resource or skill, its amount, cost, availability and location. Where useful resources or skills do not exist then they may be developed or promoted as part of preparedness activities.

# REFERENCES

**Emergency Risk Management: Applications Guide**

Emergency Management Australia Canberra 2000

**Disaster Recovery Manual**

Emergency Management Australia

**Risk Management AS/NZS 4360:1999**

Standards Australia

**Community Emergency Planning Guide**

Emergency Management Australia

**Consulting Communities**

Bureau of Rural Sciences

**Social Impact Assessment**

Bureau of Rural Sciences

**Emergency Management Manual Victoria**

Department of Justice, Victoria

(and the counterpart manuals and plans of other states and Territories)

**Disaster Risk Management**

Zamecka, A and Buchanan, G, Queensland Department of Emergency Services 1999

# APPENDICES

## APPENDIX A CHECKLIST

1. Have resilience and vulnerability assessments been undertaken and validated?
2. What data is available?
3. What additional data or information will be required?
4. What are the appropriate data sources?
5. How can you divide your community into localities/areas that are useful for social and community analysis?
6. How can you divide your community into groups that are useful for resilience and vulnerability assessment?
7. What interest groups or community associations exist which may be able to assist in assessing resilience and vulnerability?
8. What risks do your area and your community face?
9. Are there individuals, groups of people, services or areas that are particularly susceptible to risks?
10. What methods are most appropriate to achieve practical results in enhancing resilience and reducing vulnerability?
11. Are there resources, services, skills or networks within the community that can be built on to optimise resilience and to reduce vulnerability?
12. What action has been taken on the findings about resilience?
13. What action has been taken on the findings about vulnerability?
14. Have local plans and arrangements been audited and tested?
15. Has a schedule to review the analysis of resilience and vulnerability been set?
16. Have your plans been tested?
17. Has the community been actively engaged in this work?
18. Has a schedule for further assessments been set?

## **APPENDIX B ANALYTICAL AND ASSESSMENT TOOLS AND METHODS**

Listed below are a range of techniques and methods that may be used to identify problems and solutions pertinent to resilience and vulnerability. These methods are not exclusive and in many cases complement each other.

All of them have their uses. All of them have limitations.

A key limitation to assessment is the nature of change. Change, whether as desired outcomes or undesired results, is rarely linear and is often driven by complex forces. Prediction is a hazardous task. Rather than prediction it is safer and often more productive to aim for a general situational assessment of what may occur in the future.

For example, it is clear that the proportion of older people in the population is increasing. What this means, however, for health care, recreation, family relationships, household size and social welfare support is much less clear. Perhaps all we can say with confidence is that change will occur, while acknowledging that planning has to occur as rigorously and comprehensively as possible.

All assessments, being more or less estimates, need to be monitored and updated regularly.

Finally, assessments, predictions and projections are not deterministic. Within limits we have the capacity to change or modify expected outcomes to more closely meet government and social objectives.

### **Brainstorming**

This method is applied most often as a group exercise where group members think imaginatively and without restrictions on issues, problems and resources. The results will usually need to be ordered and assessed and evaluated for their applicability. This approach is useful for developing creative and unexpected solutions, for identifying otherwise unseen issues.

### **Cost Benefit Analysis**

This method typically relies on the measuring of financial and economic costs and benefits of a particular activity. Attempts are made to identify costs and benefits and these are then weighed against each other.

This method's strengths are in its systematic approach and in its efforts to attribute a common unit of measurement to items being considered. Its limitations are that many things cannot be assessed in terms of an economic cost.



## **Delphi Techniques**

This approach uses the skills, knowledge and experience of people with acknowledged expertise to assess issues and solutions. Cross checking occurs through a review process. This technique may be applied as a group process, commentary from various sources or on iterative process of exchange and comment.

This approach is useful for drawing upon detailed knowledge and skilled capacity.

## **Environmental Impact Assessment**

An assessment, using various techniques and methods of enquiry to estimate the impacts, both positive and negative, of development or other activity on environmental systems and species.

## **Focus groups and workshops**

Focus groups are meetings of selected people (or people selected from specific sections of the community) who under the management of a facilitator explore a particular issue in a structured or semi-structured way to reveal values, attitudes or behaviour.

## **Mapping**

Data of virtually any sort can be mapped, especially using modern geographic information systems. Most entities can be mapped, from demographic data to values and attitudes. Mapping is useful as a visualisation tool, allows the reader to easily see differences between areas and allows trends to be identified.

## **Profiling**

Profiles may be generated of demographic, socio-cultural, economic or environmental issues. A profile gives a snapshot for a particular area, community or group of people at a particular point in time.

## **Scanning, and Scoping**

These are alternative terms for broad brush viewing of the subject in which one is interested – view the context rather than the detail to identify broad structures or trends. It relies to a degree on intuition expertise and sensitivity to contextual cues.

## **Social Impact Assessment**

An assessment, using various techniques and methods of enquiry to estimate the impacts, both positive and negative, of development or other activity on social structure and life.

## **Surveys, Questionnaires and Interviews**

Surveys and questionnaires are tools used to ascertain perceived facts, opinions and values or types and levels of activity. They may collect useful data that needs to be collated and interpreted. Response rates may be low. Interviews may be structured or semi-structured which allows the researcher to explore particular issues in detail.

## **Trend Extrapolation**

Trend extrapolation requires the identification of existing trends or processes or directions of change and then extending these into the future. Data sources will usually be quantitative (say demographic data) or systematically listed qualitative data say responses to standard questionnaires or surveys).

This method is useful for projecting into the future and estimating, on local or broad scales, what changes or developments might be expected.

## **Cross Impact Analysis**

The outcome of processes such as Delphi techniques may be a list of possible futures or possible consequences. Cross impact analysis is a technique for assessing the consequences for each identified outcome on each other. This may be conducted through a cross impact analysis matrix. This may be done either using probability ratings where these are available or by using qualitative estimates.

## **Scenario Analysis and Planning**

Much planning, hazard analysis and risk assessment, even much social and demographic analysis, has been undertaken on the basis of a “snapshot” approach. Basically this entails assessing a situation as it “appears” at a given point in time.

This approach is relatively fast and easy and so cheap and easily conducted. For these reasons it is a useful audit tool at critical times.

It is deficient for longer term planning and for more detailed and deeper understanding of these things that create risk, generate vulnerability and work for or against achieving increased resilience.

This method also relies heavily on “expert intuition”; local or expert knowledge of existing conditions. Both forms of knowledge are valuable tools in vulnerability analysis.

However such knowledge may be diminished through personnel leaving the area or through the death or illness of those with such knowledge. Mechanisms should be in place to ensure such knowledge is maintained and is accessible in such circumstances

However, there are many features of social life, environmental processes, organisational behaviour, human interaction, and social processes and development that are counter-intuitive or not easily revealed.

Scenario analysis is a technique for delving more deeply and more intricately into complex and changing situations

It requires establishing first an issue to be explored, whether it is the impacts of a particular hazard or the range of impacts on an area.

Secondly, establishing the exploratory framework. The area to be investigated,

prevailing social and economic trends, the time frame to be considered and other broad scale issues.

Then a group of participants must be gathered. The skills, interests and responsibilities of the participants will be determined in part by the purpose and desired outcomes of the scenario exercise.

A facilitator or exercise director should be selected and briefed and chosen for their standing and expertise.

The scenario is then run according to the framework previously agreed. It requires the participants to (be encouraged) to think imaginatively and boldly to uncover all relevant, but often unexpected, issues and factors.

The role of the exercise director is critical in being able to encourage imaginative approaches to analysis, review and assessment.

The scenario provides an opportunity for people to consider an issue imaginatively and critically and to feed from the ideas and propositions and insights generated by other participants.

## APPENDIX C ASSESSMENT MATRIX

The assessment matrices drawn below are indicative of a type of analytical and evaluation method that may yield general but useful indications of differential vulnerability.

As with most assessment methods their value lies partly in understanding their limitations and the ways in which they can be reliably applied. This applies also to the results that they provide.

This assessment process like almost all vulnerability and resilience analyses, yields a comparative ranking. There are no easily applied and robust methods for assessing absolute vulnerability.

In any case policy makers, planners and managers are more interested in a comparative approach that allows them to allocate resources on the basis of priority.

We emphasise that any such analysis can only be indicative and that differential vulnerability, assessments of relative risk and indications of resilience are suggestive of priorities and relationships but not absolutely fixed. This results from the variable quality of the available data, the dynamic nature of communities and that vulnerability and resilience may change over time.

This sort of analysis will give only a general sense of vulnerability. It may not provide detail about specific elements or attributes

This method is based on a simple summation. It can however be applied to any level of social organization, individual, family group, agency, community, municipal area, region.

It requires sophistication in deciding which qualities and elements to consider and how these are to be broken up.

We have indicated earlier that there are a variety of research methods and techniques, and a large number of data sources, which can be used.

As always the crucial step is the first; what questions are to be asked.

This method allows for any quality to be assessed and given a rank score. These may then be combined, aggregated or considered in tandem to give a ranking for a broader area or social unit.

For example

Element (geographic area)	Element (where the element is positive mark as 3, neutral as 2, negative as 1 – then sum. The lower the score the higher the vulnerability				
	Remotenes s	Telecommunications Quality	Support Services	Social Networks	Total
Area A	1	1	2	3	7
Area B	2	2	3	2	9

Element (individual person)	Element (where the element is positive mark as 3, neutral as 2, negative as 1 – then sum. The lower the score the higher the vulnerability				
	Distance from services	Telecommunications Quality (Poor)	Support Services	Social Networks	Total
Old Age	1	1	2	2	6
Gender (Female)	1	2	1	3	7
Gender (Male)	2	2	1	1	6
Physical Disability	1	1	1	1	4
Low Income	1	1	1	1	4
Middle Income	2	2	2	2	8
High Income	3	3	3	2	11

These scores may be aggregated to form another matrix to show, using the above example, that a male with a physical disability is likely to be more vulnerable than a female with a physical disability.

These matrices are useful as mind clearing exercises and for scoping possible issues and solutions. But, it must always be remembered that if they are to be used for practical purposes that they should be developed properly taking into account the specific details of the elements being assessed and their context.

Depending on the scale that is being investigated (State, region or locality for example) then an appropriate level of detail, checking and verification will be required. At the level of the small group or individual for example it may be necessary to precisely state the type and severity of the disability.

This type of table gives a ranking for each assessed issue. It allows some comparison between different classes of people or between different groups or different areas. What it does not do is indicate in detail how or why each element is vulnerable or resilient.

The initial step in deciding how to divide up the elements to be cross-referenced is important. These elements should have some substantial and relevant reference to the issue they represent.

It is important that indicators do refer relevantly and directly to the issue being examined and that, as part of this, that they minimise ambiguity as to their cause or to what they address.

These simple matrices can be compiled for individuals or groups or communities or agencies and systems.

A broader picture can be developed by constructing a series of matrices and then summing or otherwise combining the results.

However, matrices can only be combined when they have a direct cause or summation relationship. So for example, combining the results of analysing the vulnerability of individuals will not necessarily give a picture of group or community vulnerability. Groups and communities, though they may in some ways embrace or overarch the individuals, are more than just the sum of their individual people. They possess qualities that will not emerge from summing a number of individual people.

## APPENDIX D DEALING WITH GRIEF: DEALING WITH LOSS<sup>1</sup>

The expression in the English language, “to come to grief” is synonymous with “to meet a disaster”. One could infer then that grief is to be considered a disaster a traumatic event. (Stroebe, Schut and W Stroebe, in J Harvey “Perspectives on Loss” 1998)

While not wishing in any way to diminish the pain of grief. It is our contention that trauma is the end point in a continuum of dealing with any significant loss

Grief is not always traumatic, in the pathological sense of that word. Trauma is the end point on a continuum describing the impact of grief of an event outside the range of usual human experiences.

People may grieve over any significant loss and come to terms with their grief relatively quickly. When people are traumatized it is then that specialists are required.

But for the most part in Community Recovery work, people who grieve after an event certainly require understanding, but also support and encouragement to work through the grieving process. Those involved in the defusing and debriefing stages of recovery can certainly provide that support and understanding thus enabling many of those affected by the event to manage their own recovery (Emergency Management Manual, Series Guide 2 Principles of Recovery Management)

Responding to the practical needs of people and communities after a disaster is relatively easy. The loss of a home, fencing, livestock, financial security is more easily qualified and quantified than the loss of security, loved ones, hope and future.

To minimize the grief of any emotional significant loss such as security may well retard the recovery and resilience of people to move on after a disaster and thus increase their vulnerability to future events.

For example, in the aftermath of the 1997 fires in the Yarra Ranges, counsellors were reporting that some parents of young children were finding difficulty in assisting their own children to deal with their emotions because they, the parents had never fully come to terms with their experiences as children in the 1983 Ash Wednesday fires.

Definition of Grief.

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<sup>1</sup> These notes on grief and loss have been included to indicate the range of responses to loss and damage and to give emphasis to the fundamental concept in assessing and managing resilience and vulnerability that not all loss is caused by damage to physical items

This paper suggests that grief is a normal and natural human reaction to any significant loss, and, proportionate to the significance of the loss will be the extent of the grief. Grief is a normal, natural process by which we adjust to the crisis of losing anything precious. We grieve not only at the death of a loved one but after the loss of anything that is meaningful and central to our lives. "Its like a death" said a survivor of the 1995 fires in N.S.W. "it's the death of a house, or home, the past 30 years of our lives and that can never be replaced" (video "15 Minutes of fire")

Grief is a regular feature of living because in life no one can have or hold onto all that we want or need. We are always losing something, adjusting to these losses is a part of life; we have to learn to live without that thing or person. It is when we suffer our most serious losses that grief is most difficult and these serious losses frequently occur in the context of a emergency or disaster, such as fire, flood earthquake, mass shootings, train and bus crashes.

Grief is normal but not well understood. The death of a farm child's pet lamb can be quite a devastating loss; to the farmer it may simply represent the loss of profit. The child expresses grief; the farmer may hardly give it another thought other than the effect on his child.

So a clear understanding of grief and the grieving process is an important factor in dealing with vulnerability and resilience within the "Recovery Process".

### Understanding Grief

Sometimes the loss of something irretrievable like a loved one who dies, an amputated limb, home or possessions burnt, causes an intensity of grief more than the loss of something or someone whom we can meet again. The finality and end of these losses are clear and obvious. Yet, a different distress, no less painful is caused by drawn out, unclear endings like a marriage breakdown or estrangement from our children, other family members community or neighbours. With death there is a clarity of loss. In broken relationships it is often hard to cut our losses, we tend to hold on to hope and so prolong the pain.

This was the experience of a number of people after the East Gippsland floods. Farmers who had to leave the family farm that had been in the one family for a number of generations. Families that took advantage of the Government by-back scheme and by moving out of the area weakened an already weak small community, who, for example needed that family to keep the school alive and open. Farmers who sold and took advantage of the offer to stay on in the farmhouse felt the anger and rejection of neighbours who had once been firm friends.

When we have been strongly attached to something meaningful and we lose it all of life is disrupted for us. Our tendency is to hold onto what was important. Letting go is difficult, living without it hard. As with the farmers, finding new opportunities, values



and friends to give our reordered lives meaning and direction takes time and new learning's. We have to work at giving up the ties that hold, the friendships hewn over many years, the familiar paths and because grief work hurts and is hard, people, especially those like farmers who pride themselves on the value of independence, can either deny or turn away to avoid the pain.

Community Recovery for some people can take years before full healing can occur and perhaps not ever. Grief is often portrayed as something emotional. But grief is more than any one feeling. It includes the whole struggle to regain a full, regular life again after our loss. In this struggle there are many feelings, hurt, anger, guilt, fear, envy, often experienced very intensely over and over again and mixed together. Helping people deal with the grief of significant losses is an important part for recovery workers in minimizing vulnerability and increasing resilience.

Helping people deal with grief includes more than helping people deal with a turmoil of feelings. It includes learning and making new patterns for living, learning new skills for going on, letting go and creating something new. There is no return to the old ways of life these must be let go, to begin again.

Living with loss. The time it takes will vary. The impact and consequences of the loss may take for some people months and even years to come to terms with.

The journey will be helped by those who accept and understand the needs that are being presented, vulnerability is a part of life, resilience can be learned as well as developed'

### Guidelines In Dealing With Grieving People

Some of the needs shared by people, families and groups may include:

- Recognition and acknowledgement
- Opportunities to express grief
- Opportunities to remember
- Opportunities to tell-and retell their story
- Listened to and heard
- Validation and acceptance of reactions
- Non-judgmental support
- Genuine respect
- Practical help
- Remembered in the immediate and longer term
- Access to resources
- Recognize and identify grief responses and develop ways to deal with these safely
- Recognition that new grief may trigger previous losses
- Recognition that death is a natural part of life

- Develop self-care strategies

#### Being there for those Grieving Requires

- Supportive listening
- Being present
- Sensitive and thoughtful words-or silence
- Non-judgmental
- Practical assistance
- Honest and genuine support
- Interest shown in memories, fears and anxieties
- Use the words, death, dies, grief, and loss
- Sitting with silences, pain and discomfort
- Respecting individuality
- Remembering special occasions
- Allowed to talk, not talk, cry, and not cry
- Sit with any expressions of anger and guilt
- Seek support for yourself if needed

Adapted from Worden 1993

Accessed from "Outreach Grief Services

## APPENDIX E: USEFUL REFERENCES AND RESOURCE MATERIALS

Many of these references are available through the Web, and a very useful starting point is the Emergency Management Australia website at [www.ema.gov.au](http://www.ema.gov.au), then follow through to the links section and to the virtual library for online pdf versions of the Australian Journal of Emergency Management.

Not all of these are practical manuals, but all offer insights and perspectives that offer new perspectives on resilience and vulnerability

Australian Geological Survey Organisation **Community Risk in Cairns: A multi-hazard risk assessment** Commonwealth of Australia 1999 Canberra Overview pp 10 - 24 Chapter 1 pp25 - 34 Urban Geohazard Risk Assessment and Appendix E A Methodology for Assessing Relative Community Vulnerability pp 241 – 248

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