

The background of the entire page is a photograph of a wildfire. The fire is intense, with bright orange and yellow flames in the lower half, transitioning to dark, smoky grey and black in the upper half. The texture of the fire is grainy and detailed. At the top, there is a white rectangular box containing the title text.

**ASSESSING COMMUNITY RESILIENCE
TO WILDFIRES:
CONCEPTS & APPROACH**

Paper Prepared for SCION Research

by

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1 INTRODUCTION

This paper was prepared for SCION/Forest Research as background to its current research programme on how to better protect of life, property, and economic and conservation resources from wildfire in New Zealand's rural environments. Objective 4 of this programme is focused on improving community recovery following wildfires. This includes coming to an understanding of community recovery and resilience to wildfire events. As part of this work, Fitzgerald Applied Sociology was commissioned to

- Scope out the concept of 'community resilience' and its meanings in the New Zealand context,
- Scope out the method/s to be used to assess resilience in communities affected by fire (in the light of other disaster events), and
- Scope out a protocol for community engagement.

Drawing on the current international and New Zealand literature, the first part of this paper examines the key concepts of community, resilience, and related to these, vulnerability. The second part of the paper addresses how these concepts might be operationalised in community case studies to assess the impacts of wildfire, and the practical terms for engaging the case study communities.

2 KEY CONCEPTS

2.1 COMMUNITY

The term 'community' is used frequently, yet its definition is highly contested. Claudia Bell describes the lack of consensus as follows: "The only thing about 'community' upon which sociologists are wholly agreed is the difficulty in defining it." (1997: 37)¹. Having said this, common themes can be found and have been discussed in the classic investigation of 94 separate definitions of community by Hillery (1955, in Bell, 1997).

Essentially, the concept of community can be broken down into three parts. Firstly, a 'community' is *a group of people who interact together*. Second, *these people hold some norms, values and goals in common*, and third, *the community occupies a particular geographic area or locality*. If a collectivity of people fulfils only the first two aspects of this description they are termed a 'community of interest'. A collectivity of people that fulfils all three aspects mentioned is termed a 'community of location' or 'community of place'².

There is also a tendency among planners and non social scientists to assume that 'community' (of location or interest) also means homogeneity and harmony among the members. This is simplistic and erroneous. The reality of communities is that they are more often heterogeneous groups within which inequality and conflict exists. The romanticising of the notion of 'community' can mask these traits. At the same time, with a community of location there are communities of interest which constitute overlapping functional (and often subgroups).

Communities as both location & interest-based units of social organisation are made up of individuals and various types of formal and informal groupings of individuals, some of which

¹ Bell, C. (ed), 1997, *Community Issues in New Zealand*, The Dunmore Press.

² Cocklin, C. & Jacqui, D. (eds), 2005, *Sustainability and Change in Rural Australia*, UNSW Press.

are enduring and some are temporary. As Taylor et al (1990)³ note, in addition to physical proximity, life-style and values, other common bases for community formation and cohesion (as well as diversity and conflict) include social class, work, gender, ethnicity, kinship, age and length of residence, and religion. Communities of location generally consist of a network of overlapping interest (and identity) groups, (though a community may be formed around a particular shared 'interest', such as employment in a single-industry or adherence to a particular religion). Groupings can include families, households, and groups of friends and neighbours, clubs and societies, and legally and formally constituted organisations such as school boards, local fire brigades etc. People generally belong to a range of groups, especially in rural areas.

In rural NZ, there are several challenges for researchers, including:

- deciding on the geographical boundaries of the community (which may vary according to which aspect of community life and functioning is being examined), and
- the role of communities of interest that extend beyond the particular locality – that is, who and what groups are 'in' the particular community.

In the literature on resilience, the term community is used quite broadly. Generally it is used to refer to communities of location, ranging from rural districts through to cities. However, the literature also covers different social units, including individuals, households, families, local communities, administrative and social organisations. In this regard the word community can probably be substituted in some cases with 'human', and in others with 'social' or 'societal'.

In our view, the unit of analysis that should be used for this study should be *communities of location/place* within rural New Zealand, accepting that research on community resilience will need to also take into account individuals and the various types of groups that make up the social collective.

2.2 RESILIENCE

2.2.1 Definitions & definitional issues

Dictionary definitions of resilience refer to the *ability of something to withstand or resist*, and *ability to recover/ bounce back into shape* from a shock, disturbing event, adversity, or rapid change in conditions.

Resilience is therefore a property of a 'thing', with general definitions of resilience commonly referring to the properties of robustness/strength and flexibility. The 'things' or entities discussed in the literature range from the highly abstract to the very concrete, including:

- systems and system components or elements (e.g., ecosystem, economic system, etc),
- physical structures, objects and materials,
- social organisational units (individual, family, community, district, region),
- administrative, service-provider, and 'social' organisations.

When used as an adjective (e.g. a 'resilient community') it refers to a thing that exhibits the properties associated with resilience – and generally can only be discerned or gauged in relation to a potentially damaging or threatening event.

³ Taylor, N., Goodrich, C., Bryan, H. 1990. *Social Assessment: theory, process & techniques (1st edition)*. Centre for Resource Management, Lincoln.

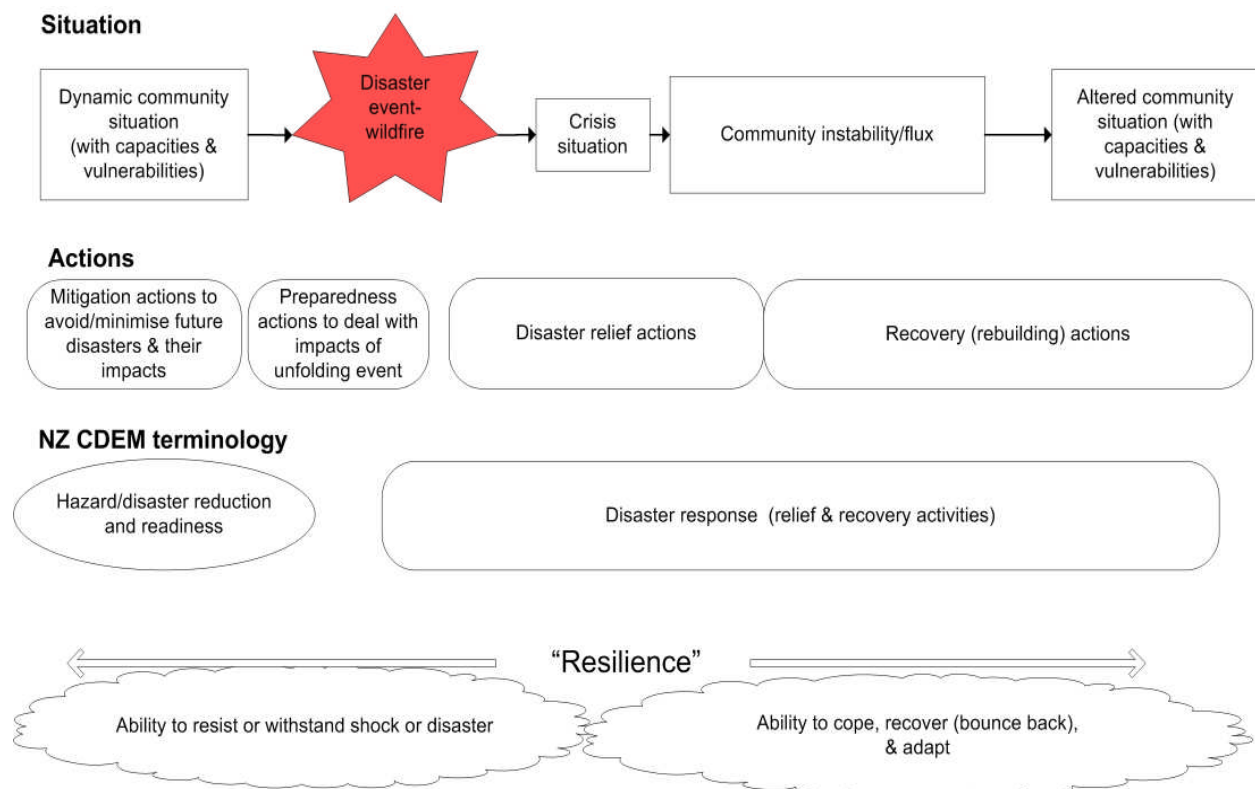
Different disciplines conceptualise resilience in different ways. Across the literature, (including emergency management legislation, guidelines etc), there is an array of interlinking terms relating to:

- the nature of the disturbing event, such as risk, threat, crisis, emergency, catastrophe, and disaster
- the condition or state of the 'thing', such as resilience, preparedness, vulnerability, sustainability, capacity, capability, and preparedness
- actions in relation to the disturbing event, such as mitigation, preparation, relief, response, recovery, adaptation, and coping.

The range of overlapping terms is confusing and frustrating. Even emergency management researchers and agencies use these key terms in different ways. This has been evident recently in the reporting on the Boxing Day (2004) Indian Ocean tsunami by different relief agencies. The following sections attempt to summarise the concepts and views from relevant disciplines and recent literature.

For the purposes of clarity in the discussion, figure 1 presents some of the key concepts in relation to the timeline of a disturbing (or hazard) event – indicated by the 'situation' line– with the 'actions' line indicating the actions or activities that are associated with each phase along the timeline.

Figure 1



2.2.1 Engineering

Natural hazard engineers and related physical scientists tend to talk about hazard events in terms of economic loss or damage to structures and infrastructure systems. Resilience is therefore discussed in terms of the strength and flexibility (or elasticity) of materials, structures and systems – i.e. *resilience is the ability of materials, structures etc to withstand a shock or stress, and their ability to self-correct once this shock has occurred.*

However, as in other fields, the thinking about resilience seems to be changing. For example, Comfort (1999:21), in relation to responses to earthquake disasters, defines resilience as “*the capacity to adapt existing resources and skills to new situations and operating conditions*” – implying a learning feedback from a disaster event into anticipatory activities (i.e., mitigation and preparedness).

The idea that resilience includes an ability to learn and adapt can be seen in the recent work of Bruneau and others at the University of Buffalo Multidisciplinary Center for Earthquake Engineering Research (MCEER). They talk about ‘community seismic resilience’ as

“the ability of social units (e.g. organizations, communities) to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimize social disruption and mitigate the effects of future earthquakes.” (2003)⁴.

The emphasis therefore seems to be shifting away from research to minimise loss through stronger structures etc, towards the idea of building resilience through improving anticipatory planning and action.

The MCEER’s focus in terms of community resilience tends to be on crucial infrastructure and organisations, with the aim of

- enhancing “the ability of a community’s infrastructure (e.g. lifelines, structures) to perform during and after an earthquake”;
- enhancing “emergency response and strategies that effectively cope with and contain losses”;
- enhancing and developing “strategies that enable communities to return to levels of pre-disaster functioning (or other acceptable levels) as rapidly as possible.” (all Bruneau, 2003).

In this Bruneau/MCEER framework, resilience performance (the outcome) is expressed as “reduced failure probabilities,” “reduced consequences from failures”, and “reduced time to recovery.”

Bruneau et al propose four features or aspects of resilience which can be used to measure a system’s performance – which they call “the 4 R’s”:

- Robustness – the “strength, or the ability of elements, systems, and other units of analysis to withstand a given level of stress or demand without suffering degradation or loss of function” (i.e., their impact *resistance*);
- Redundancy – the extent to which the system or parts of it are substitutable in an event (i.e., an aspect of preparedness/readiness);
- Resourcefulness – the capacity to mobilise resources and act to relieve or respond to a threat/event (i.e., to muster an impact response);
- Rapidity – “the capacity to meet priorities and achieve goals in a timely manner in order to contain losses and avoid future disruptions” (i.e. bounce back or recover from an event within a specified amount of time).

In addition, the framework identifies four “dimensions” or domains of ‘community’ functioning (referred to as ‘system performance functioning’):

- Technical, i.e. physical/hardware systems (e.g. water supply, transport network);
- Organisational, i.e. organisations responsible for managing and operating critical facilities and which undertake relief and recovery activities;

⁴ Bruneau, M., Chang, S., Eguchi, T., Lee, G., O’Rourke, T., Reinhorn, A., Shinozuka, M., Tierney, K., Wallace, W., & von Winterfeldt, D. 2003. A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities. *Earthquake Spectra*, Volume 19, No. 4, pages 733–752.

- Social, i.e. people, communities, governments etc;
- Economic, i.e. businesses and the local economy.

Technical and organisational performance are about the impact on physical systems and their operators/managers, while social and economic performance are about the consequences or impacts of the impacted physical systems on the community as a whole.

Using this framework, an analysis of resilience (and required preparatory or enhancement actions) can be expressed in a matrix – which can also be used to look at any particular sub-dimension (e.g. the physical water supply system and its components) (Figure 2)

Figure 2: MCEER Resilience Analysis Framework

	Criteria of Resilience			
	<i>(ends or outcomes of resilience)</i>		<i>(means of achieving resilience)</i>	
<i>Dimension</i>	<i>Robustness</i>	<i>Rapidity</i>	<i>Redundancy</i>	<i>Resourcefulness</i>
Technical				
Organizational				
Social				
Economic				

In their published work to date, Bruneau et al have offered only preliminary indicators or variables for assessing robustness, rapidity, redundancy and resourcefulness for each ‘dimension’. So while the above analytical matrix could provide a useful tool for assessing community or even household-level resilience prior to or following a wildfire event, suitable variables would need to be developed and tested for the current study on resilience to rural wildfire in New Zealand.

2.2.2 Ecology

Ecologists tend to think of resilience as the ability of an ecosystem to *recover* from a disturbance, while the ability of an ecosystem to withstand the disturbance is termed “*resistance*” (Bellingham, pers com, 2005). This is confirmed by Millar (1999) whose glossary of environmental terms defines resilience as the “*ability of a living system to resort itself to original condition after being exposed to an outside disturbance that is not too drastic*” (pp G11)⁵.

The concept of resilience as being the ability of a system to bounce back or re-attain equilibrium is largely derived from seminal work by Westman (1978) and Holling (1973). However, they use different terms to describe the relevant properties. For example Holling refers to resilience as a property that results in “*persistence or probability of extinction*”, while “*stability is... the ability of a system to return to an equilibrium state following a disturbance*” (1973:17)⁶.

Audrey Majer’s definition of resilience also reflects the distinction between resistance/robustness of a system, and the ability of it to recover. She notes that resilience is “*the degree, manner, and rate of recovery of an ecosystem to a pre-disturbance condition*” (1989), including the *potential* of an ecosystem to recover⁷.

⁵ Millar, G.T. 1999. *Living in the Environment: Principles, Connections, and Solutions*. Brooks/Cole Publishing, Pacific Grove, CA.

⁶ Holling, C.S. 1973. Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics* 4: 1-23.

⁷ Quoted by <http://www.forestryencyclopedia.net/Encyclopedia/>.

More recently, Mayer et al, in discussing sustainability, notes that

Although the word “resilience” has been used somewhat interchangeably with stability, persistence, and resistance, the term usually refers to the time required for a system to return to a particular dynamic regime after a perturbation, or to the amount of perturbation that a system can absorb before shifting to an alternate dynamic regime⁸.

There appears to be some difference of opinion among ecosystem scientists about these various terms. For example, Jones et al, in a 1990 dictionary of environmental science, define ecosystem resilience as the “*robustness or durability displayed by an ecosystem in the event of [environmental] changes*”⁹. They also refer to resilience as the probability of the extinction of an ecosystem. Elsewhere ecosystem resilience is described as “the capacity of an ecosystem to cope with disturbances, such as storms, fire and pollution, without shifting into a qualitatively different state” (Swedish Ministry for the Environment, 2005: 2¹⁰). The latter publication goes on to note that a resilient ecosystem has the capacity to withstand shocks and to rebuild itself if damaged, and that without resilience, it is vulnerable. Other ‘official’ definitions of resilience include both the ability of ecosystems to withstand shocks as well as the ability to return to an equilibrium state, including self-renewal¹¹.

In ecology, therefore, resilience is contentious, being taken to mean several things:

- a) the ability of ecosystems to recover from a shock or disturbance, including self-repair and adaptation (which Hollings refers to as stability);
- b) the ability of ecosystems to withstand a shock or disturbance, (which some refer to as resistance);
- c) both the ability to withstand a shock and the ability to recover from it.

Most of these definitions and discussions around them appear to be founded on the assumption that the natural state for ecosystems is stasis, rather than dynamism and adaptation.

Such definitions have been applied by environmental managers to the human domain. For example the Swedish Ministry for the Environment refers to ‘social resilience’ as “*the ability of human communities to withstand and recover from stresses, such as environmental change or social, economic or political upheaval*” (op cit:1) – with resilient ‘socio-ecological’ systems measured or characterised by:

- the amount of change the system can undergo and still retain the same controls on function and structure;
- the degree to which the system is capable of self-organization;
- the ability to build and increase the capacity for learning and adaptation.

⁸ Audrey L Mayer, A.L., Thurston, H.W., & Pawlowski, C.W. 2004. The Multidisciplinary Influence of Common Sustainability Indices. *Frontiers in Ecology and Environment* 2(8): 419–426. www.frontiersinecology.org.

⁹ Jones, G., Robertson, A., Forbes, J., Hollier, G. 1990. Dictionary of Environmental Science. Collins, Glasgow.

¹⁰ Swedish Ministry for the Environment. 2005. Resilience and sustainable development: a report for the Swedish Environmental Advisory Council. Ministry for the Environment, www.mbv.gov.se.

¹¹ see, for example the European Community Biodiversity Clearing House: <http://biodiversity-chm.eea.eu.int/>; and Resilience Alliance: http://www.resalliance.org/ev_en.php

2.2.3 Emergency and hazards management

The main agency for emergency management in NZ is the Ministry of Civil Defence & Emergency Management (MCDEM). It defines resilience as “*a measure of how quickly and effectively a system or community can recover from an event*”¹². Emergency Management Australia’s definition is “*a measure of how quickly a system recovers from failures*”. Both the New Zealand and Australian official definitions of resilience are therefore similarly narrow, being confined to “bouncing back”, and imply system stasis .

The MCDEM note that, within its risk management framework, resilience has four components (which they also call ‘the 4 R’s’):

- Reduction, which includes identifying and analysing the risks to people and property from hazards, taking steps to eliminate these risks, and reducing their potential impacts;
- Readiness, which is about developing operational systems and capabilities (ability to deliver resources) before an emergency happens – including self help and response programmes for the public;
- Response, which is the actions taken immediately before, during, or directly after an emergency, as well as actions to help communities recover (effectively);
- Recovery, which includes activities designed to help restoration of an affected community’s social, economic, and physical well-being – including its capacity for self-help.

As can be seen, despite resilience been taken to be an indicator of the ability of a something to recover from an emergency or hazard event, the four component R’s are not explicitly conceived as measures/parameters for assessing resilience, but rather as a set of risk management activities that may contribute to it¹³. According to the MCDEM, good performance in carrying out each of the four risk management activities results resilience, as seen in its definition of resilient communities as “*communities that know their risks, have reduced their vulnerability, and have the ability to respond to and recover from the impacts of such risks*”.

As can be seen, the use of the term resilience in the context of emergency management in New Zealand (and Australia) is confusing: here resilience is both a *measure* (i.e. indicator) of a thing’s ability to recover, and is the *property* the thing acquires from the sound application of activities to reduce risk to that thing. The only parameter offered for assessing the resilience (of a community for example) is the *speed of recovery* from a destructive event. The implied argument is that by undertaking the 4 R activities, a community will recover faster than it might otherwise do because it would have sustained less damage.

A community that recovers fast (i.e., it is resilient) has “reduced vulnerability”. Vulnerability is defined by the MCDEM as “*the exposure of a community or social group in being able to anticipate, avoid or reduce, cope with, and recover from the consequences of a hazard(s) that they face*”. Despite the apparent tautology in these definitions, the implication here is that a community that is well able to anticipate, avoid, reduce, cope with, and recover from the consequences/impacts of a potential or actual hazard event is less exposed to the loss from such an event.

Expanding the two sets of definitions the MCDEM seems to be saying that the speed of recovery (or bouncing back) of a community from a hazard event will be a function of:

- its knowledge about the risks faced if the event occurred
- its anticipation of the potential impacts if the event occurred
- its ability to reduce the potential impacts before an event occurs
- its ability to respond if and when an event occurs

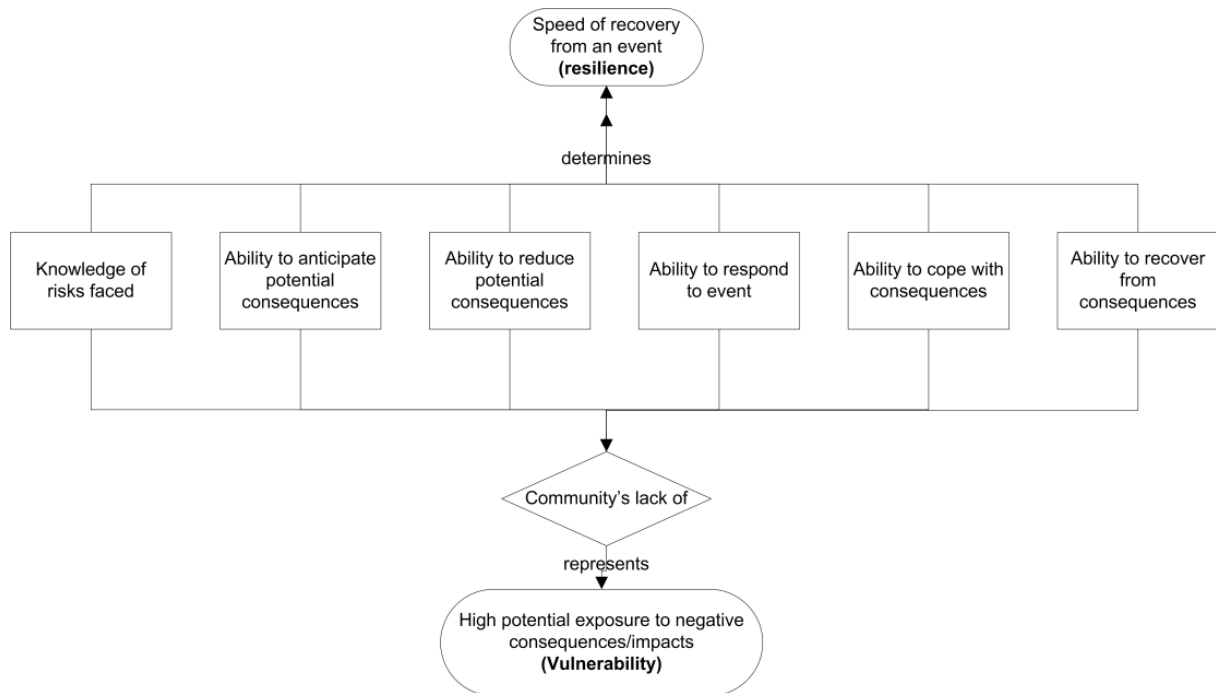
¹² Ministry of Civil Defence & Emergency Management, 2005. <http://www.civildefence.govt.nz>

¹³ Forest Research’s own research proposal (8876-NPHZ-FRI) uses this risk management terminology – referring to reduction, readiness, response and recovery as the “4 Rs of risk management”.

- its ability to cope with the impacts if and when the event occurs
- its ability to recover from the impacts of an event if and when it occurs.

Figure 3 presents the relationship between resilience and vulnerability as represented by the MCDEM's definitions

Figure 3: Implied relationship between resilience and vulnerability (from MCDEM definitions)



The notion of vulnerability/exposure to loss seems to be more clearly expressed in one of two of Emergency Management Australia's definitions of vulnerability: *"the degree of loss to a given element at risk or set of such elements resulting from the occurrence of a phenomenon of given magnitude"* (in Buckle et al, 2001:5¹⁴). The term 'element' is used here in the same way as our use of 'thing' earlier – and could refer to a structure, system or community. In this case vulnerability is a function of the magnitude of the event.

A vulnerable community is therefore one that could encounter relatively high levels of loss or damage from an event of particular magnitude because, in advance of an event, it lacks sufficient ability to anticipate what might happen, avoid or reduce the potential losses and other consequences, and cope with the losses and other consequences afterwards. A resilient community might therefore be one that has the necessary abilities and can quickly recover if a disaster event happens.

Emergency Management Research

Increasingly hazard & disaster agencies and researchers are paying attention to predicting and modelling the resilience of a system, community, etc in advance of a hazard event with a view to enhancing its ability to withstand, survive, and recover from the potential damage. This comes through in the emergency management (EM) research literature.

¹⁴ Buckle, P., Marsh, G., Smale, S. 2001. *Assessment of Personal and community resilience and vulnerability: report EMA project 15/2000*. Canberra, Emergency Management Australia.

The thinking about resilience in the area of emergency management has tended to be similar to that in engineering and related physical sciences and in organisational management, though this thinking has increasingly drawn on psychology and sociology.

For example, Paton et al (2001:27) talk about resilience in general as

the capacity of systems to maintain their integrity and the relationships and balance between elements in the presence of significant disturbances by drawing upon internal resources and competencies to manage the demands, challenges and changes encountered¹⁵.

Paton & Johnston note that resilience can “operate at several interdependent levels”, e.g., individual (as outlined below) and community. In their work, “community resilience” is described as “*the ability of a community to ‘bounce back’ and recover using its own resources*” (2001:273)¹⁶. A resilient community (i.e. one that recovers well) is “capable of drawing upon internal resources and competencies to manage demands, challenges and changes encountered” in the course of a disaster (ibid). Paton & Johnston’s main means for assessing resilience at the community level is through questionnaire-based sample surveys of individuals, households, and businesses – the responses to which are aggregated to provide a picture of ‘the community’. Community focus groups have also been used to gain a group perspective on disasters and their impacts.

Buckle and others associated with the Victorian State Emergency Recovery Unit have concerned themselves with the notion of community vulnerability and how it might be assessed and reduced. In a 1998 paper¹⁷, Buckle notes that until recently emergency management has largely been concerned with the hazard itself, the priorities being the description, measurement, control of hazards in order to achieve effective prevention and suppression, but that attention has been shifting to trying to understand the social activity and issues around prevention and recovery from hazard events. Buckle goes on to note that EM is not just about “hazard causation”, but also involves “ understanding the full range of consequences of hazard impact” and of “the relationships of environmental, political, social and economic forces that influence or shape the frequency, nature and location of emergencies” (1998:21). The new trans-Tasman risk-management based approach has required improving the understanding among emergency managers of the nature of community, and of vulnerability.

Buckle defines community as “any grouping of people that have something in common, something shared”. Various bases for community are provided, including communities based on location (e.g. administrative boundary, cultural unit such as a town, or hazard zone, such as flood plain), and communities based on interest or identity (e.g. economic activity, age, gender, ethnicity). Vulnerability is defined as “a propensity” or “susceptibility... of a person or group or system to loss” (1999 and 2001¹⁸). He and his colleagues imply the term includes deficit ‘needs’. As they point out, vulnerability is essentially an expression of weakness or lack of capability with respect to those things that create resilience, i.e. vulnerability is seen as the complement of resilience.

Buckle and his colleagues therefore see resilience as complementary to (or counterbalancing) vulnerability, and is defined as “*the capacity [of a person, group, or system] to withstand damage or to recover from a loss*” (1998:22 and 2001:5). In terms of

¹⁵ Paton, D., Johnston, D., Smith, L., & Millar, M. 2001. Responding to Hazard Effects: Promoting Resilience and Adjustment Adoption. *Australian Journal of Emergency Management*, Autumn 2001:47-52.

¹⁶ Paton, D., & Johnston, D. 2001. Disasters and Communities: Vulnerability, Resilience and Preparedness. *Disaster Prevention and Management* 10 (4): 270-277

¹⁷ Buckle, P. 1998. Re-defining community and vulnerability in the context of emergency management. *Australian Journal of Emergency Management*, Summer 1998/99: 21-26.

¹⁸ Op cit.

people and communities, it is taken to be “*the capacity that people or groups may possess to withstand or recover from emergencies*” (1998) or to “manage their own support” (2001). Buckle argues that in emergency management there should be more effort put into building resilience in communities, i.e. “enhancing skills and other attributes to minimise loss in the first place or to strengthen capacity to recover” (2001:6).

Buckle suggests various “meta-categories” of individual and group vulnerability/[resilience] which can be used for doing assessments and to plan interventions:

- management capacity – e.g. capacity to deal with one’s own affairs and meet one’s own needs,
- resource availability – e.g. wealth, income, insurance,
- cultural attitudes and values – to do with how people see themselves & others,
- access to services – e.g. literacy, physical distance,
- social connectedness /isolation,
- experience of significant and rapid change [because rapid, unanticipated, and poorly understood change makes people more anxious and vulnerable],
- pre-existing stressors – e.g. exposure to disaster.

He also proposes categories (or a scale) of loss or damage, including death and injury, trauma, damage to homes, damage to social networks, damage to expectations, values and beliefs, damage to the bio-physical environment, damage to business, community disruption and dislocation of social networks, and damage to infrastructure. Follow-up impact monitoring could also make use of indicators of community well-being such as death rates, morbidity, suicide rates, mental illness, accident rates, property sales, divorce, and bankruptcies and business closures.

An important aspect to Buckle et al’s work is that they recognize that resilience and vulnerability are attributes of some particular thing (people, communities) and are framed by and within a wider physical, social, economic, and cultural context – including longer term trends, and prevailing social norms and values. Hence they suggest that vulnerability and resilience assessment should consider:

- the attributes of the person or group in question,
- the domestic and local conditions, capacities, values & preferences,
- the potential hazards & risk environment,
- the broader social, cultural environmental and economic determinants and influences
- the trends in broad social, economic, political and environmental conditions.

In addition to being assessed in context, they further note that vulnerability/resilience is differential (between person/group and between hazard events), and that it is specific to a particular risk/hazard/issue.

Using these concepts and understandings, Buckle et al have developed guidelines for Victoria for assessing resilience and vulnerability in the context of emergencies (2000). In these they suggest factors that support community resilience, such as:

- Shared community values, aspirations and goals – especially shared and positive sense of the future and commitment to the community as a whole, agreement on community goals, and shared ‘culture’
- Established social infrastructure, including social networks & organisations
- Positive social and economic trends, especially having a stable or growing population and economic base
- A sustainable social and economic life, including capacity to weather disruption
- Active partnerships between agencies, community groups and commercial enterprises – sharing knowledge, experience & resources
- Communities of interest – both formal and informal – including skills and expertise

- Established networks – i.e. clear and stable links between people and groups that enable sharing & exchange of information and resources and involved in local planning
- Resources and skills – especially those associated with emergency preparedness and recovery.

It is not clear whether these 'factors' are the product of research or are hypothetical.

2.2.4 Social work/mental health

The concept of resilience has received a lot of attention in the area of social work and counselling over the past 10 years. Much of the recent literature focuses on family resilience and how it can be enhanced.

Various definitions of resilience are provided in the literature, for example:

- The ability to bounce back from adversity, overcome the negative influences that block achievement, and to survive or even thrive in a challenging environment or in the face of hardship¹⁹
- "The ability to withstand and rebound from disruptive life challenges... It involves dynamic processes fostering positive adaptation within the context of adversity"²⁰.
- "Positive adaptation under adverse circumstances" (McKay, 2003²¹).
- The ability to bounce back/rebound from adversity strengthened and more resourceful than before. It involves 'endurance', 'coping', 'self-righting', and 'growth in response to crisis and challenge'. (Walsh, 1998)²²
- Positive adaptation within a context of significant adversity (Luthar et al, 2000²³), including "the potential for personal and relational transformation and growth that can be forged out of adversity" (Boss, 2001²⁴).

Family resilience is therefore thought of as the ability of the family and its members to withstand, rebound from, and positively adapt to, disruptive life challenges or significant adversity.

McKay (op cit), in reviewing the literature on family resilience, notes that resilience tends to be latent in families and individuals, and is only observable indirectly in various aspects of family functioning when difficulties occur. Recent studies in this area focus on identifying the social and psychological resources of families and methods for fostering families' capabilities and strengths, rather than on their vulnerabilities/risks, failures, or pathologies. Walsh (2003) notes three aspects of family functioning as being important to resilience:

- Appropriate family belief systems, which include:
 - making meaning from adversity (understanding the nature and meaning of crisis and stress) – which relates to having a problem-focused coping style,
 - having a positive outlook (focus on strengths, perseverance and optimism),
 - transcendence and spirituality (i.e., having faith, rituals, and belief in the ability to learn and grow).

¹⁹ North Central Regional Educational Laboratory (NCREL) http://www.ncrel.org/sdrs/cityschl/city1_1b.htm

²⁰ Walsh, F. 2003. Family Resilience: A Framework For Clinical Practice (Theory and Practice). *Family Process* 42:1-18.

²¹ Mackay, R. 2003. Family Resilience and Good Child Outcomes: An Overview of the Research Literature. *Social Policy Journal of New Zealand* 20: 98-119.

²² Walsh, F. 1998. *Strengthening Family Resilience*. New York: The Guilford Press.

²³ Luthar, S.S., Cicchetti, D., & Becker B. 2000. The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, 71: 543-562.

²⁴ Boss, P. 2001. *Family stress management: A contextual approach*. Newbury Park, CA: Sage Publications.

- Appropriate family organisational processes, which includes:
 - flexibility (the ability to adapt over time)
 - connectedness (support and commitment to family members),
 - use of available social and economic resources.
- Appropriate communication processes, which includes:
 - clarity of communication,
 - open emotional expression (sharing, empathy, blame avoidance, and pleasurable interactions),
 - collaborative problem solving (resourcefulness, shared decision-making, conflict resolution, and a focus on goals and being proactive).

Saleebey argues that of these, the most important in the long term is “a positive orientation to the future” (2001:78²⁵).

Other work from the mental health area that seems relevant to research on the impacts of wildfires includes research on grief and human responses to loss.

2.2.5 Psychology

Resilience is a term that appears only infrequently in psychological literature. The most relevant work deals with how individuals cope with difficulties, that is, the way people go about reducing the negative consequences of threats & stress. In psychology, therefore, resilience can be taken to be about *the ability of people to cope with threats and stress*. A resilient person is therefore one who copes successfully in difficult or threatening circumstances (e.g. a natural hazard event), in that the stressful situation is improved or relieved, emotional-well being is protected, and physical health is maintained. (Smith & Mackie.1995²⁶).

Typically psychologists measure the ability to cope in terms of the psychological impact of an event – using standard methods such as the ‘Hopkins Symptom Checklist’ (developed by Derogatis, L.R., Lipman, R., Rickels, K., Uhlenhuth, E.H. & Covi, L., 1974), or Weiss & Marmar’s ‘Impact of Event Scale’, 1997. In practice, these scales measure the presence of pathology such as stress (including Post Traumatic Stress) and depression.

Smith & Mackie (1995) note that research indicates that people cope better in the longer term when they use problem-focused coping strategies, rather than emotion-focused coping, though this is closely related to a person’s appraisal of controllability of the situation.

The use of psychological models in EM research

Psychological understandings of resilience have been utilized in the work of NZ disaster researchers Doug Paton and David Johnston. Drawing on a model proposed by Tobin (1999), Paton and his colleagues discuss individual resilience (i.e. of a person) in terms of “*the capability to resist adverse hazards effects*”. They argue for the importance of individual resilience because “individuals will be responsible for their safety and well-being until institutional resources recover” (2001:47²⁷). In other work, Paton & Johnson (e.g. 2001²⁸) expand on their definition of individual resilience as being “*the ability to recoil effectively from adversity, and enhancing the likelihood of exposure to adversity leading to growth*”. This

²⁵ Saleebey, D. 2001. Human Behaviour and Social Environments: a Biopsychosocial Approach. New York: Columbia University.

²⁶ Smith, E.R. & Mackie, D.M. 1995. Social Psychology. New York: Worth Publishers.

²⁷ Paton, D., Johnston, D., Smith, L. 2001. “Responding to hazard effects: promoting resilience and adjustment adoption”. Australian Journal of Emergency Management, autumn 2001: 47-52.

²⁸ Paton, D. & Johnston, D. 2001. “Disasters and communities: vulnerability, resilience and preparedness”. *Disaster Prevention and Management* 10 (4): 270-277

reformulation therefore takes into account the idea of people being able to draw out and utilise their own latent capacities in the face of severe difficulty, and as a result, grow and become stronger. This echoes the recent thinking from social work and family mental health outlined above.

Three factors have been found (by Paton et al, Bachrach et al, Bishop et al, and others) to be important to individual resilience:

- *self-efficacy* – i.e. the conviction that one can behave or perform successfully in a given situation. The concept of self-efficacy comes from Bandura 1977, and was developed by Ajzen as “perceived behavioural control” in his theory of planned behaviour (discussed in Eagley & Chaiken, 1993)²⁹
- *coping strategy*, specifically use of problem-focused coping rather than emotion-focused coping (see Smith & Mackie, 1995:162)
- *sense of community*, or “the feeling of belonging or attachment to people and places”. In other words, the individual’s sense of social connectedness. Such connectedness has been shown to be associated with community and social support network involvement during times of disaster etc. This has a community-level equivalent in the notion of social capital.

In summary, individual response to an extreme event such as a wildfire is important to community resilience because communities are made up of individuals and the groups to which they belong, and are therefore relevant to the way a community responds. Psychological research on disasters also provides a useful model for thinking about resilience as well as proven measures for assessing individual resilience in advance of and after an event.

2.2.6 Sociology

Resilience is not a common term in sociology. Development and environmental sociologists tend to refer to the broader notion of ‘sustainability’. However there is considerable debate on what constitutes a sustainable community or society, and about which human or social characteristics contribute to or diminish sustainability.

2.3 VULNERABILITY

The term ‘vulnerability’ features prominently in the resilience literature and is often employed in tandem with resilience, as outlined above in reference to the work of Buckle et al. Most writers consider resilience and vulnerability to be closely related. This relationship has been explained in various ways, a number of which are discussed here.

2.3.1 Mental health & social work

Vulnerability is a more common term than resilience in disaster mental health research, which makes the relationship between these terms difficult to discern. However both refer to the individuals ability to ‘cope’, or access adequate ‘coping resources’ (i.e. capacities). In psychology, positive mental health outcomes of a disaster are generally regarded as unlikely, with the focus on outcomes tending to be on the negative impacts of stress such as Post Traumatic Stress Disorder (PTSD).

²⁹ Eagley, A. H. & Chaiken, S. 1993. *The Psychology of Attitudes*. Harcourt Brace & Company, Orlando.

In disaster mental health research, a vulnerable individual is seen as one who is already exposed to a high degree of stress prior to the disaster event (e.g. wildfire) occurring. This means that the vulnerable individual's resources or capacities are being employed to cope with their present situation and therefore may be unavailable (or limited) when a disaster occurs. Researchers therefore tend to recommend that in the event of a disaster, mental health resources be allocated to the most vulnerable and those who experience the most damage and disruption (Tierney, 2000)³⁰.

The 'family resilience framework' (outlined by Walsh, 2003) that is used in clinical social work practise is based upon a 'strengths perspective' which focuses on families' abilities or capacities, rather than their weaknesses (Saleebey, 2001). Vulnerability is therefore not a central term in the framework and, although limitations and risks are recognised, they are not dwelt upon. A vulnerable family unit would be regarded as one that is operating under a high level of stress and risk prior to a disaster such as a wildfire.

2.3.2 Emergency Management Research

According to work done by Buckle, Marsh & Smale (2001) regarding assessment of personal and community resilience and vulnerabilities, vulnerability refers to the "susceptibility of a person or group or system to loss". The relationship between resilience and vulnerability is described (somewhat vaguely) in this way;

"They are linked in a double helix. While they are not opposites nor ends of a continuum, there are direct and strong linkages between them." (Buckle et al., 2001³¹)

As part of emergency planning, preparation of a community 'resilience and vulnerability profile' can improve the targeting of work to effect change. Guidelines for undertaking such assessments have been developed by Buckle et al for use in Victoria.

2.3.4 Sustainable development

In the field of sustainable development and poverty reduction, the sustainable livelihoods (SL) framework provides a holistic model for understanding the physical and social context in which people attempt to sustain themselves. The model is summarised in Figure 4.

In this approach livelihoods are put at the centre of development planning (Twigg, 2001). The framework explicitly acknowledges that people's lives and livelihoods are shaped by external events to which people are more or less vulnerable. Vulnerabilities, or more correctly threats and opportunities, include 'shocks' (such as disasters or extreme events), local and international 'trends', and 'seasonality' effects. Shocks and other changes damage important natural resources and physical capital (such infrastructure, equipment, housing etc). People's ability to access and utilise livelihood assets is strongly influenced by government, non-government and informal policies, institutions and processes (Twigg et al., 2001). Policies etc also shape people's ability to withstand shocks and cope with negative trends and seasonal effects.

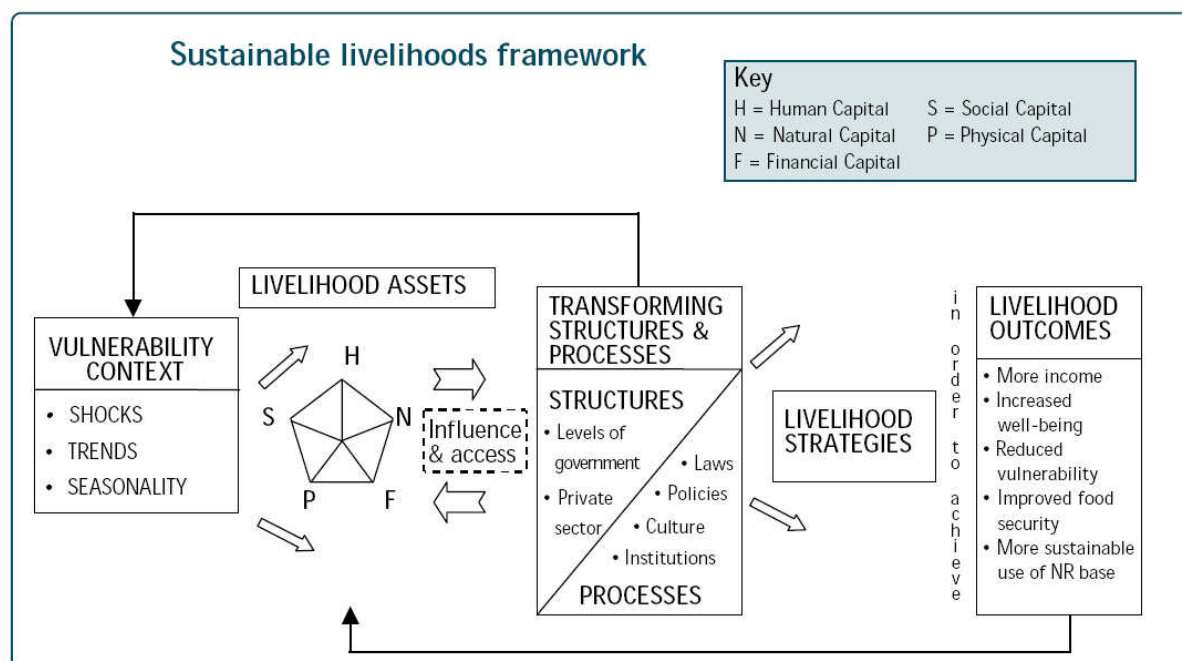
As well as lacking necessary livelihoods assets, poor people in developing countries have been found to be more vulnerable to disasters and other unfavourable events because they lack the capacity and resources to prepare for and respond to them. Decreasing poverty and increasing the sustainability of livelihoods therefore involves consideration of the prevailing 'vulnerability context'.

³⁰ Tierney, K 2000. Controversy and Consensus In Disaster Mental Health Research. Unpublished paper.

³¹ Op cit

The overall sustainable livelihoods framework is presented in figure xx:

Figure 4



Resilience is not a central concept within the SL framework, although a resilient individual or community could be considered to be one with a sustainable livelihood.

Within the framework, resilience (including people's capabilities/capacities) and vulnerability are interrelated. However, unlike similar frameworks such as the Vulnerability Assessment model adopted by the UNDP, they are not treated as opposite ends of a continuum (Cannon et al., 2001³²). For example, shocks and other challenges to peoples' lives can also represent livelihood opportunities, including increasing peoples' individual and collective capacities to respond to and cope with difficulties, which in turn can be harnessed for local development.

According to this approach, development projects and programmes should include efforts to reduce the exposure of people and their livelihoods assets to shocks, negative trends and seasonal downturns etc. This may include enhancing their human, physical, social, and financial capital, possibly improving the sustainability of their use of the available natural capital, and changing the institutional environment, laws etc to be more supportive.

The work of Buckle et al on vulnerability assessment is therefore consistent with the SL framework in that vulnerability is seen a product of people's wider circumstances, including the economic, environmental, socio-cultural, and political context.

2.4 SUMMARY

Examining the various definitions and conceptions of resilience we can see two "orientations"

- the dominant orientation is towards seeing a shock/disaster/natural hazard event as a challenge to the existing system – the community, its resources, and its functioning. Therefore, resilience is about the ability of a system/existing community

³² Cannon, T., Twigg, J. & Rowell, J. 2001. Social Vulnerability, Sustainable Livelihoods and Disasters: Report to DFID. Chatham, Kent: University of Greenwich.

to resist and bounce-back (into “shape”) from the disturbance (which is depicted as negative)

- another orientation, found in family psychology and other areas, is towards seeing a shock/ natural hazard etc as an agent that stimulates change and potentially brings about system development or evolution. Therefore, resilience is about the ability to adapt positively or advantageously to a change in conditions or circumstances.

Keeping these two orientations in mind, community resilience might be therefore be defined in the context of the current project as *the ability of a community to sustain itself in the face of a wildfire event, and to adapt positively in its aftermath.*

“Sustaining” means people recovering or bouncing back from the effects/losses etc of a wildfire. That is, the social system and related systems survives, and in the longer term at least returns to its previous state or condition. Thus “sustain” in this definition can be interpreted as the community *surviving undiminished in its functioning and condition.*

Adapting means the community survives, absorbs the losses etc (including to its livelihoods assets base), and in the longer term achieves a state more appropriate to the new situation or environment. Adapting is not only surviving, but also absorbing the lessons and opportunities offered by the disaster to achieve an improved condition and functioning.

The use of the term resilience represents an effort to think about the effects of extreme events on people (as well as physical structures/infrastructure systems and livelihoods assets) in terms of latent or actual capacities of people to cope. Instead of the emphasis being on minimising losses and negative impacts, disaster managers and others have therefore become interested in finding out how to build the relevant capacities and capabilities of people and communities, and how to reduce or eliminate those things that diminish or undermine resilience. In terms of the SL framework, this involves strengthening the asset base, including human and social capital, and developing appropriate policies, laws, and governance institutions.

3 ASSESSING THE RESILIENCE OF COMMUNITIES TO WILDFIRE

Unit of Analysis

The current project entails coming up with ways to assess the resilience of communities. A narrow approach might be to focus only on the resilience of the structures, functions and processes that are relevant at the “community” (collective) level. However, in an extreme event the lives and livelihoods of the individuals and groups that make up are collective are affected and often in different ways. In smaller rural communities the ability of the community to sustain itself and adapt depends largely on the situation of the individuals and groups within it. Understanding the resilience of individuals, families, and other groups is therefore important to understanding the resilience of the collective.

Timing of Assessment

The current project ultimately aims to improve rural communities’ resilience to wildfire. Given the timeline of a disaster noted on figure 1, assessment of a community’s resilience to wildfire should look at the following situations

- Pre disaster – i.e.. readiness/preparedness
- During – i.e.. response
- After – i.e.. recovery & adaptation

Key questions regarding assessment of resilience

In considering how to go about studying community resilience to wildfire, the following questions need to be addressed

1. How to assess the resilience of a community a) before a wildfire event that might never happen, and b) after an actual event, (as indicated in the FR research proposal)?
2. What will be the unit of analysis/assessment e.g. individual, family, group/organisation, and/or community resilience?
3. To what extent should social, economic, institutional and environmental context be taken into account (as for example in the Sustainable Livelihoods Framework)?
4. What indicators and what measures should be used, and which indicators are most important
5. And depending on the answers to the above, what methods should be used to gather the data?

What needs to be assessed?

As discussed, a resilient community can be taken to be one in which people (at a collective and individual level) both have the capacity and are able to

- a) assess and mitigate the risks of a potential wildfire [reduce/mitigate/avoid]
- b) have in place arrangements for recognising and dealing with a fire if it eventuates, [readiness/preparedness]
- c) take action to minimise damage to property and people when a wildfire eventuates [respond]
- d) supply relief for those affected by the fire and accompanying events [relieve]
- e) survive and take action to rebuild itself after a fire [recover], and
- f) on the basis of the experience, make necessary changes to be in a better position to cope with a fire (or other disaster) in the future [adapt, and be less vulnerable]

Within the context of this research programme, an assessment of community resilience to wildfire should therefore address each of these aspects or components of resilience.

RESEARCH SCOPING & DESIGN

The following sections present a possible research design for community case studies covering the various aspects of resilience at the household and community levels, and at two points in the disaster “timeline”. As such it represents a research scoping exercise, the details of which would need to be decided in discussion between the research team members.

The overall design is summarised on four diagrams: Household level before and after an event, and community level before and after an event. These diagrams link the key concepts and previous literature into an overall logical design – along with recommended methods

3A. ASSESSING COMMUNITY RESILIENCE PRIOR TO A WILDFIRE EVENT

The following case study design is primarily intended for communities that have not experienced a recent wildfire event. However, for communities that have experienced a recent wildfire, it can also be used to assess the pre-fire situation (see section B below).

1. SOCIO-DEMOGRAPHIC PROFILING

Method/s: analysis of secondary data & statistics, other secondary sources, observation & key informant interviews

Determine the social boundaries of the community for each case study community. If necessary do this in consultation with key informants (e.g. district council, community board member/s etc). Where possible, align these with administrative boundaries and census data boundaries (e.g. Statistics NZ /area units).

Using census data and other secondary sources (such as building consent etc data from the district council) prepare an overall profile, including key trends (see process used in SIA – Taylor et al, 2004). Review written community histories where available, including noting any “disasters” that may have occurred within the life span of community members (e.g., post 1920).

2. ASSESSMENT OF COMMUNITY-LEVEL CAPABILITIES AND VULNERABILITIES

Method/s: interviews, focus groups/ workshops with key informants; analysis of secondary data

2.1 Inventory and assessment of state of shared resources/capabilities/assets

- Human: Includes skills, knowledge (education etc) at a collective level. Most important here would be the ability to organise
- Natural: Includes tangible resources necessary for local livelihoods and economy, especially in natural resource dependent communities (e.g. farming, forestry, tourism, fishing etc)
- Financial: Includes availability/reliability of community-level financial assets (e.g. of organisations and administrative bodies), rates-base, insurance etc.
- Physical: Includes shared basic infrastructure and facilities that enable local people to be productive and live locally. e.g.. transport infrastructure, water supply & sewage system, irrigation systems, communication systems, and service facilities such as schools, community health centres, halls, marae, shops/businesses etc.
- Social: Includes key internal and external social networks that create a sense of community connectedness, and mutual security (both formal and informal groups/organisations etc. Lists of local organisations and active membership (and trends) would also be useful. Useful indicators in the census data are the time spent in voluntary activities. General level of participation in local affairs.

2.2 General characteristics of local livelihoods

- Degree of flexibility/adaptability of livelihoods in the district
- Degree of sustainability of local livelihoods

2.3 Institutional & structural context

Identify and describe the key local (& district) institutions that have an active role in supporting (and inhibiting) the capabilities of the community and in reducing their vulnerabilities.

- Government & quasi government – local, regional, national
- Private sector
- Local social and cultural ‘norms’

2.4 Vulnerable groups

Identify and describe vulnerable groups. Buckle (2000) provides some pointers e.g.

- the aged (particularly the frail), & the very young
- the disabled (mental and physical) & chronically ill
- the poor - people with limited financial and other resources or struggle to meet their needs
- people with limited psychosocial coping capacity
- people living in inadequate or temporary accommodation
- non English speakers /new arrivals; the socially isolated; the physically isolated
- large families and single parent families
- those at risk from machinery/equipment/technology failure
- people on holiday and travelling (particularly those in tent and caravan resorts) and tourists
- people living close to areas of hazard.

2.5 Vulnerability Context

Identify and describe the “vulnerability context” (as per the SL framework) e.g. is the community affected (positively or negatively) by, or has a history of being affected by

- Seasonality (of production, incomes, employment opportunities, availability of ‘volunteers’ etc).
- Shocks
- Changing trends e.g. population, resources, national/international trends, trends in governance/politics, technological trends.

3. ASSESSMENT OF LOCAL UNDERSTANDING OF WILDFIRE, PROBABILITY AND POTENTIAL IMPACTS/RISKS

Method/s: interviews, focus groups/ workshops with key informants; analysis of secondary data such as records and reports; Johnston et al’s awareness & preparedness questions.

3.1 Prior experience of disaster

Describe any prior experience of disaster. Describe the community-level impacts arising from the event/s: e.g. what were the impacts on local

- Human capital/assets
- Natural capital/assets
- Financial capital/assets
- Physical capital/assets, including infrastructure
- Social capital, e.g. social/organisational, institutional

Which institutions etc responded, and helped or impeded recovery?

What was the effect of the event on community resilience and future preparedness?

3.2 Assess Local Perception of Wildfire Risks and Potential Impacts

This could be done using a modified version of Johnston et al's tsunami/coastal hazards preparedness survey form (questions 1-22) applied in a workshop situation or key person interviews.

4. ASSESSMENT OF COMMUNITY MITIGATION & PREPAREDNESS

Method/s: interviews, focus groups/ workshops with key informants; analysis of secondary data such as records and reports

4.1 Organisational capability

Assessment of leadership capability, Availability of resources, equipment etc, participation, planning to date, and covering

- Wildfire risk management (identification & mitigation)
- Wildfire response arrangements
- relief arrangements
- recovery arrangements

4.2 Supporting Networks

What networks to relevant agencies are in place to assist in preparedness activities, to respond to a fire, and to assist in relief and recovery?

What is the capacity and state of these supporting networks?.

3B. ASSESSING COMMUNITY RESILIENCE FOLLOWING A WILDFIRE EVENT

For case studies where there has been a recent wildfire event, two exercises are required at the community level, i.e. assessing the situation before the event, and assessing the situation after the event. In the context of this research programme, a third exercise may be required, that is an examination of how resilience can be enhanced or improved for the future.

1. ASSESSMENT OF THE SITUATION PRIOR TO THE RECENT EVENT

This exercise could follow the format of that outlined above for a study of a community prior that had not had a recent wildfire event. At a minimum, a community socio-economic and capacities profile should be prepared.

2. DESCRIPTION OF THE RECENT WILDFIRE EVENT

Method/s: Analysis of official and unofficial reports; key informant interviews, focus groups and workshops.

2.1 Describe the nature, timing, scale, duration of the event

2.2 Describe the local emergency & organisational response to the event

2.3 Describe the community response and reaction

3. DESCRIBE IMMEDIATE IMPACTS

This refers to the response to the event and immediate post-event relief and recovery situation

3.1 Impacts on physical infrastructure, assets etc (description and losses/damage)

- social/community facilities,
- shared utilities water electricity, telecoms
- other, e.g. transportation, commercial, service facilities etc

3.2 Community-level economic impacts

- district/local losses, and relief provided
- local businesses
- commercial activity

3.3 Impacts on social relations/social impacts

- between groups and sections of community
- on cooperation (& conflict)
- on social capital in general (utilisation/mobilisation of social capital)
- support provided to the community from other communities etc

These could possibly be assessed using existing questionnaire/scale tools

3.4 Impacts on human capital/capacity

- death/injuries
- on size and composition of community
- on availability of personnel

- on skills and capabilities

3.5 Impacts on natural capital

- reserves/public spaces/aesthetic
- other natural assets utilised by community

3.6 Institutional/organisational Impacts

- governance & leadership, including capacities (e.g. local government, other agencies, local organisations)
- services and service provision
- emergency response arrangements & institutions

4 LONGER TERM IMPACTS - NEGATIVE & POSITIVE

This refers to the longer term recovery and post recovery situation, and to both negative and positive impacts.

Method/s: Analysis of official and unofficial reports; key informant interviews, focus groups and workshops; observations

4.1 Impacts on physical assets/capital

- social/community facilities,
- shared utilities water electricity, telecoms
- other, e.g. transportation, commercial, service facilities etc

4.2 Community-level financial/economic impacts

- community funds & availability
- insurance/insurability
- access to credit/loans
- fire fighting cost
- value of losses

4.3 Impact on social relations & social capital

- structure/organisation
 - including relations with other communities/organisations etc
 - loss/creation of networks & organisations
- functioning
 - social capital creation & destruction
 - cooperation/conflict
 - utilisation/mobilisation of social capital

4.4 Impacts on human capacity /capital

- health and wellbeing
- size and composition of community
- skills/abilities base

4.5 Impacts on shared natural assets

- productive
- non productive

4.6 Impacts on sustainability of key capacities/assets

4.7 Impacts on institutional/organisational arrangements & context

- governance
- administrative & support services

5 IDENTIFICATION OF POSSIBLE MEASURES TO ENHANCE COMMUNITY RESILIENCE IN GENERAL

Method: community-level /key person workshop

- 5.1 mitigation measures & arrangements
- 5.2 resistance measures & arrangements
- 5.3 event response measures & arrangements respond to /cope with event
- 5.4 recovery measures & arrangements

6 WHAT HAS BEEN LEARNED, AND WHAT HAS CHANGED RE WILDFIRE & DISASTER MANAGEMENT?

Method: community-level /key person workshop

3C. ASSESSING HOUSEHOLD RESILIENCE - PRIOR TO A WILDFIRE EVENT

The following outlines a possible approach to assessing the resilience of households within the case study communities. The household-level assessment is intended to complement the community-level assessment as outlined previously, rather than substituting for it by aggregation of individual household cases. This approach also avoids the trap of assuming homogeneity in communities, and enables assessment to be done on a variety of household types.

Since project resources are unlikely to be sufficient to draw a big enough sample of households for it to be statistically representative, it is proposed that in each case study community households would be selected on the basis of the broader community social profile. This will ensure a degree of representativeness.

The following design applies to households in case study communities that have not experienced a recent wildfire event.

Methods: face to face interviews using a combination of structured and semi-structured questions/questionnaires; observation.

1 HOUSEHOLD PROFILE

This should cover

- Household size, type & composition
- Years in community
- Education

- Livelihood/s
- Other basic socio-demographic data

2 ASSESSMENT OF HOUSEHOLD CAPABILITIES AND VULNERABILITIES

Describe overall position and describe household's livelihood strategies

2.1 Availability of human resources/capacities

- Basic capacities
 - formal and informal skills (education etc),
 - life experience,
 - employment, occupation, work,
 - health status and issues
 - mobility
 - leadership roles/involvement,
 - management capacity
 - attitudinal items such as basic outlook, awareness of risks etc

- Household cohesion, connectedness (low, or very high levels are indicative of family dysfunction).
- Household Belief Systems (Walsh, 1998, notes that family belief systems are at the centre of family functioning and they are seen as a powerful resource to resilience – see Walsh's categories)
- Household Organisational Patterns & processes (according to Walsh includes flexibility, connectedness and ability to mobilise social and economic resources

- Household communication and problem solving (see Walsh)

2.2 Availability and condition of natural capital,

- Key natural assets especially those used for household livelihood

2.3 Availability of financial capital

- availability/reliability of cash or equivalent - savings. Includes inflows, e.g.. wages, pension, remittances.
- access to credit,
- insurance.
- Overall position (very secure ... precarious)

2.4 Availability of physical capital

- basic infrastructure (changes to the physical environment that help people meet their basic needs and be more productive) and
- producer goods
- natural risk/fire management infrastructure
- community-wide assets required for household livelihoods/life.
- housing and housing quality

2.5 Availability of social capital

- membership of local and other organisations and formal groups
- membership of networks (social, psychological, financial),
- important local relationships of trust/reciprocity/support
- general connectedness to others

2.6 Livelihood type and key livelihoods strategies

- describe
- degree of flexibility
- degree of sustainability

2.7 Vulnerabilities

- Presence of vulnerable household members
- Influence of seasonality
- Potential shocks
- Trends impacting on household situation
- Assets on which household is highly dependent

2.8 Institutional & structural context of household

- Key local & regional government influences on household situation (enabling & disabling)
- Key cultural and institutional influences

3 HOUSEHOLD'S UNDERSTANDING OF WILDFIRE, PROBABILITY AND POTENTIAL IMPACTS/RISKS

3.1 Prior experience of disaster event – locally and elsewhere

- Describe experience if any
- Impacts experienced
- Effects of event on household resilience

- Influence on future disaster preparedness

3.2 Perception of Wildfire Risks and Potential Impacts

Using Johnston et al questionnaire modified for wildfires

4 HOUSEHOLD PREPAREDNESS AND MITIGATION STRATEGIES (SPECIFIC TO WILDFIRES)

4.1 Fire risk management

- What (if anything) have they done to reduce the risks/mitigate the effects of a potential wildfire?
- What have they done to increase their ability/capacity to mitigate negative impacts of wildfires on the household, livelihoods, and resources?

4.2 Wildfire response arrangements

- What practical measures and plans are in place in case a wildfire occurs? (e.g.. fire breaks, communications, evacuation plan, involvement in a disaster response group)
- How aware are they of any early warning systems, plans etc
- What evacuation practises & training for emergencies have they been involved in.

4.3 Relief arrangements

- What resources & plans (if any) do they have available to provide relief to others
- Where would they go for relief?

4.4 Recovery arrangements

- What strategy would they tend to adopt to recover from a wildfire
- Who (including organisations) would they rely on to recover
- What resources do they have available to help them recover from a wildfire
 - Social
 - financial

3D. ASSESSING HOUSEHOLD RESILIENCE - FOLLOWING A WILDFIRE EVENT

As above with respect to community-level assessment, a household-level assessment after a wildfire event is made up of two related exercises: the situation before the wildfire, and the situation after the fire (in the immediate aftermath for communities that have recently experienced a fire, and in the short and long term for communities that have had a fire less recently)

Methods: Face to face interviews, using a question schedule with both closed and open ended questions; specific use of various assessment tools

1. ASSESSMENT OF THE SITUATION PRIOR TO THE WILDFIRE EVENT

This exercise could follow the format of that outlined above for a study of a household that had not had a recent wildfire event. At a minimum, a community socio-economic and capacities profile prior to the event should be prepared. Coverage should include

- A Household social profile
- A capabilities and vulnerabilities profile, including livelihoods assets
- Prior experience of disaster and impacts
- An assessment of prior understanding and awareness of wildfire, probability and potential impacts/risks
- Pre-existing wildfire preparedness and mitigation strategies

3 DESCRIPTION OF ACTUAL RECENT WILDFIRE EVENT

The intention here is to get a picture of the wildfire as understood and experienced by the particular household. It is expected that different household would have different understandings of the event, as well as different experiences and impacts.

3.1 Describe the nature, timing, scale, duration of the event as experienced by the household

3.2 Describe the emergency management response

3.3 Describe the household reaction & response

4. DESCRIBE THE IMMEDIATE IMPACTS ON THE HOUSEHOLD

Identify both positive and negative impacts

4.1 Impacts on physical infrastructure & assets etc (description and losses/damage)

- Losses, e.g. damage to buildings, equipment, and infrastructure
- Effect of these losses (e.g. ability to farm)

4.2 Economic/financial impacts

- Losses/gains to income
- Other immediate financial losses (e.g. crops, stock, inventory etc)
- Impact on short-term financial position

- Adequacy of Insurance coverage (if any)
- Financial/income assistance received (if any)

4.3 Impacts on social relations/social impacts

- Household relationship, cohesion, & connectedness (see Walsh assessment categories & questions)
- Neighbourhood and community relationships & cohesion
- Impact of negative impacts on relationships/networks

4.4 Impacts on human capital/capacity

- Health & wellbeing of household members, including injuries, stress (PTRS questions?)
- Availability of labour and skills required by household/enterprise

4.5 Impacts on natural capital

- Damage to natural assets utilised by household
- Damage to other natural assets

4.5 Institutional/organisational Impacts

- Impacts of institutions, organisations & agencies on household position

4.6 Overall impacts on livelihoods strategies & goals

- Short term changes/adaptations to household livelihoods strategies (e.g. employment off-farm)

5. DESCRIBE THE LONGER TERM IMPACTS ON THE HOUSEHOLD

The aim here is to identify enduring effects, of effects that only emerged in the longer term.

5.1 Impacts on physical infrastructure & assets etc

- Net Losses
- Recovery actions

5.2 Economic/financial impacts

- Overall changes to financial position
- Impact on insurability, access to credit etc
- Adequacy of resources for recovery and assistance provided (if any)

5.3 Impacts on social relations/social impacts

- Household relationships, cohesion, & connectedness (see Walsh assessment categories & questions)
- Neighbourhood/network changes (membership, composition)
- Overall changes in neighbourhood and community relationships & cohesion
- Effect of impacts on relationships/networks

5.4 Impacts on human capital/capacity

- Longer term health & wellbeing of household members, including existence of PTRS, injuries etc
- Changes in availability of labour and skills required by household/enterprise
- Skills and knowledge gained

5.5 Impacts on natural capital

- Long term loss/damage/modification to natural assets utilised by household
- Other losses and gains
- Recovery interventions required

5.6 Institutional/organisational Impacts

- Impacts of institutions, organisations & agencies on household position
- Institutional support and etc barriers to recovery

5.7 Overall impacts on household livelihoods

- Overall changes/adaptations to household livelihoods strategies
- Overall impacts on household livelihood sustainability/vulnerability

5.8 Changes in Institutional & structural context

6 WHAT COULD THE HOUSEHOLD HAVE DONE TO INCREASE THEIR RESILIENCE TO WILDFIRE?

6.1 To prepare for and mitigate potential effects (in advance)

6.2 To respond to the wildfire situation

6.3 To resist the fire

6.4 To recover/bounce back from the impacts of the fire

3E KEY RESEARCH TASKS

At community level

- Identify and select 'pre-event' and 'post-event' study communities
- Prepare community profiles
- Identify local key organisations and individuals
- Meet/liaise with key organisations and individuals and secure local support & sponsorship for the case study (including specifying timing, scope, process, ethics etc). Might include local community board, council rep, Fed Farmers, etc.
 - Identify sensitivities/additional support that might be required if a post-fire community
 - Develop protocol on how to deal with households still having difficulties (e.g. intervention)
 - Obtain input for household interview selection
- Design standardised key person interview schedules (pre and post event)
- Design key person workshop process (perhaps 2 workshops)
- Identify and secure secondary data (especially regarding wildfire event) from relevant agencies etc
- Conduct key person interviews & workshops
- Collate and analyse interview and workshop data
- Plan and conduct community feedback meeting/workshop to report on overall findings. Possibly include disaster preparedness briefing

At household level (in parallel with community-level studies)

- Decide on number of interviews, criteria for household selection (e.g. not key persons), and rules for who should be present for interviews
- Develop household interview schedule, including use of available indicators and scales
- With assistance from local leaders/key people/sponsors, select possible households for interviewing.
- Approach households using standard process and information pack, and secure agreement to be interviewed (might require 2 interview sessions per household).
- Conduct interviews
- Collate and analyse household interview data

