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CONTENTS

FIGURE

APPENDICES

ABSTRACT

The Crown vision for Civil Defence Emergency Management (CDEM) is "Resilient New Zealand – communities understanding and managing their hazards". Resilience can be considered with regards to several interdependent levels: built environment; attitudes/behaviours; and community and cultural factors. Working to develop resilience characteristics within a community can influence the way our communities prepare for, respond to and recover from disasters.

This paper discusses how to measure and build resilience and at New Zealand society's capacity to draw upon individual, institutional and collective resources to cope with and adapt to the demands and challenges of natural disaster occurrences. Research shows that individual and institutional attributes can be used as resilience indicators, and this paper looks at these indicators with regard to eight New Zealand case studies where community programmes have been successful in developing resilience.

This publication is a 'how to' guide aiming to provide an outline of how to measure and build resilience and what resilience means for New Zealand communities. The guide outlines the key indicators of resilience and provides details about each while providing suggestions for the emergency management community on targeting and developing these indicators in communities. The paper discusses available resources and communication messaging to help build resilient communities, and comments on how to link the development of disaster resilience with other community development initiatives to provide a cost-effective approach to risk management.

KEYWORDS

1.0 WHAT IS COMMUNITY[1] RESILIENCE?

Resilience is an 'adaptive capacity' - that is, society's capability to draw upon its individual, collective and institutional resources & competencies to cope with, adapt to, & develop from the demands, challenges and changes encountered before (e.g., to the challenges of economic disruption preceding volcanic event), during and after a disaster.

Research has shown that a number of community, individual and institutional attributes can be used as indicators of resilience. Broadly these indicators can be grouped into three areas:

1.   **Making a Difference**, where people need to know that the small things they do can make a difference for themselves, their families and their neighbours;
2.   **Participation and Empowerment**, where communities are directly involved in identifying their risks and determining solutions for themselves;
3.   **Leadership and Trust**, where communities are supported by institutions who encourage community lead initiatives and where mutual trust and respect exist.

By working to develop these characteristics within a community, we can influence the way our communities prepare for, respond to and recover from disasters.
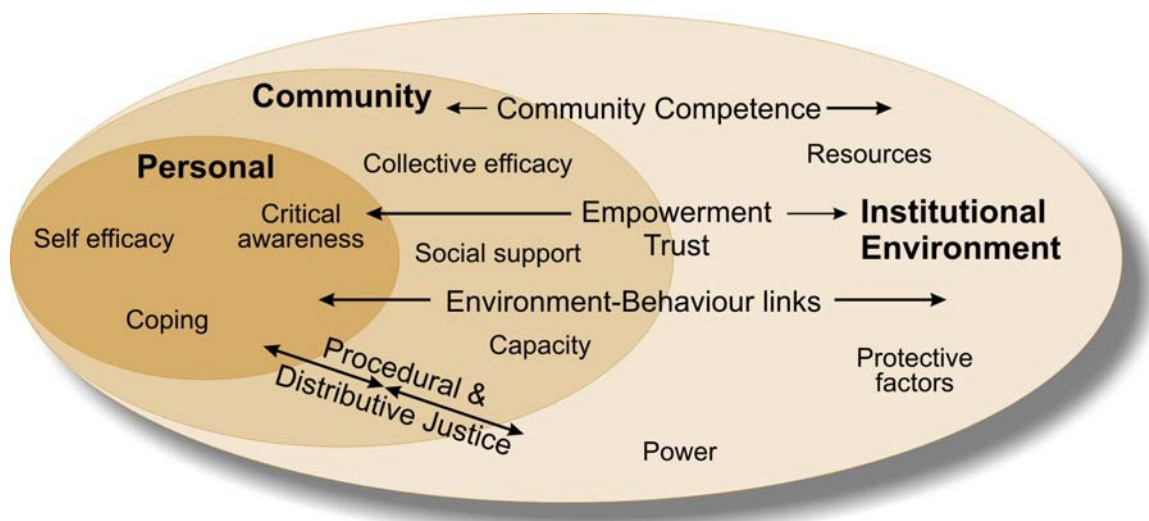
Figure 1   A model of community resilience, showing selected indicators at each level (personal, community and institutional) and relationships between them (adapted after Paton, 2006).

1.1 How do we measure resilience?

It is possible to measure the indicators mentioned above, and link this information to how resilient a community is currently. To date, these indicators have been measured by undertaking surveys. From analysis of the surveys we can determine the most critical resilience factors (indicators) for each community – i.e. which of the personal, community and institutional factors are most strongly affecting resilience in that community. It is important to note that all indicators must be assessed. Resilience is a function of the interdependencies between these factors. This also means that intervention must be

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[1] Community in this context applies to the 'public'; individuals and their interactions with one another, other groups and societal institutions.

directed at all factors. They cannot be treated separately. However, intervention may not be required for a given predictor if its assessment reveals that it is present at high levels.

Measurements of the indicators can be taken before hazard education and intervention strategies are employed, to get a baseline set of data about a community's current resilience, and an understanding of where intervention strategies should be focussed. Once the intervention strategies have been employed, it is then possible to again measure these indicators at a later stage, to see whether resilience has increased. By doing ongoing measurements, intervention strategies can be assessed for their effectiveness and adjusted if necessary. Because of the interdependencies between predictors measurement of all predictors is required, even for those not targeted for interventions. The relationships between variables mean that the model should be viewed as a system. Changes in one component can result in changes in others. On-going measurement of all predictors can thus be used to compile a composite measure of resilience and this can be used to assess changes over time.

1.2   What does this mean for communities?

There is a benefit in understanding resilience factors in your community and how to affect them. Among other factors, increasing resilience has been shown to:

- Decrease recovery time post event,

- Increase community self-reliance reduce demands on limited emergency response resources during response and recovery and increases the availability of community members to assist recovery,

- Result in a better community response to warnings,

- Lower casualty numbers and associated costs,

- Reduce built environment and property damage,

- Increase the chances of businesses surviving after a disaster,

- Reduce psychosocial problems, such as trauma and stress,

- Reduce the overall economic costs of a natural disaster.

Understanding what drives your community's resilience helps to come up with better risk communication strategies and practical tools for working with the community - once you have an understanding of the resilience factors that are important in your community, how they interact, and to what level they currently exist, you can develop programmes that target the factors for that particular community.

At a personal level work to – develop people's problem-solving skills (action coping), increase their belief in the benefits of hazard mitigation (outcome expectancy) and their belief that what they personally can do will make a difference (reduce negative outcome expectancy).

At a community level work to – encourage active involvement (community participation) in community affairs and projects and develop the community's ability to resolve collective issues (articulating problems).

At an institutional level work to – develop an individual's ability to influence what happens in their community (empowerment) and the level of trust they have in different organisations (trust).

1.3 How do we build resilience?

This publication is intended to be a practical guide that can be used by the emergency management sector to build resilience in communities. The guide focuses on key attributes known to build resilience (and represented in the form of indicators), and provides ideas and information to illustrate what can be done to develop these attributes.

Although many community programs do not have a specific resilience-building component, the content or structure of a program, regardless of its primary purpose, may be easily modified to include some resilience principles.

Intervention to increase resilience will require strategies that accommodate both hazard and community factors. It is therefore imperative that community development and emergency management agencies work together to effect change (D. Paton, 2007a).

1.4 Outline of the guide

A number of specific indicators are addressed in this guide:

- **Individual indicators**
  Self-Efficacy
  Outcome-Expectancy
  Critical Awareness
  Action Coping

- **Community indicators**
  Community Participation
  Articulating Problems

- **Institutional/societal indicators**
  Community Empowerment
  Trust

This publication is an informative 'how to' guide and:
1. Provides an outline of what resilience is, how to measure resilience, how to build resilience and what this means for communities.
2. Outlines the key indicators of resilience.
3. Provides details about each of the indicators, including what they mean and how previous research has shown them to be important.
4. Provides suggestions for the emergency management community about how to target and develop the attributes/indicators in communities.
5. Provides case studies where community programmes and interventions have been successful in developing resilience, and shows how such case studies link with the resilience indicators.
6. Provides further information on other influences such as resources (financial and non-financial) and makes comment on where communication and programme evaluation fits within building resilient communities.

7. Provides further links to information about strategies for building resilience, programme evaluation, and research on resilience.

It is important to note that the predictors of resilience develop in the course of people's everyday life experience. This makes it possible to link the development of disaster resilience with other kinds of community development initiatives. Linking these can lead to more cost-effective approaches to risk management.

And remember if it seems overwhelming…
Start small…grow BIG!
Building resilience in our communities is a gradual, on-going process and will take time and commitment. Start with a few small achievable objectives and grow from there. Doing something small sooner rather than later will get the process underway.

If resources were scarce attention could be directed to securing change in those factors with a direct relationship with intention to prepare: e.g.
- reducing negative outcome expectancy
- increasing positive outcome expectancy
- action coping
- community participation.

Change in these factors would have some knock-on effect with regard to changing levels of articulating problems, empowerment and trust (D. Paton, 2007a).

2.0 SELF-EFFICACY

"I can do something to mitigate the effects of a disaster"

2.1 What is self-efficacy?

Self-efficacy is an individuals' appraisal of what they are capable of performing in a given situation. Relating to disasters, it may be a belief in an ability to do something about mitigating the effects of disasters (e.g. preparing to reduce the adverse effects of a disaster). Self-efficacy develops as a result of people effectively solving problems and dealing with challenges in everyday life and builds up over time as people accumulate such experience.

2.2 Evidence for the importance of developing self-efficacy

People who have a higher degree of self-efficacy are more likely to prepare for disasters (Bishop, 2000; Duval & Mulilis, 1999; Lindell & Whitney, 2000; Paton, Millar, & Johnston, 2001). Because it increases the number of plans people develop and their persistence in applying them, self-efficacy increases the likelihood that people's resilience will be sustained over time.

Researchers (Bishop, 2000; Paton, Smith, & Johnston, 2000) have found a correlation between self-efficacy and involvement in community activities (e.g. membership of community clubs, local action groups). This suggests that those who have higher levels of self-efficacy have developed this from dealing and becoming involved with every day community issues (Lindell & Whitney, 2000).

Personal involvement in, and responsibility for, decisions regarding personal safety, which come from being part of a community group are characteristics that increase a person's capacity to respond effectively to hazard effects (e.g., they increase people's problem solving experience). People with a high self-efficacy therefore feel that they have the ability to prevent damage and be self-sufficient in the event of a hazard through their own efforts and preparation.

Self-efficacy can link with response efficacy (the perception of the efficacy of a preparedness measure giving protection – also known as outcome expectancy) (Duval & Mulilis, 1999).

2.3 Suggestions for developing self-efficacy

- Encourage participation in community activities
  - o Provide incentives (community awards; give-aways etc.)
  - o Make it fun
- Include "what to do" alongside hazard and risk information in education materials so that individuals can identify what they can personally do to reduce their risk and be prepared to respond
- Encourage personal responsibility for hazards and safety.

2.3.1 Case Study

Title Waikuku Beach

Indicator Self-efficacy

Overview Waikuku Beach is situated on the east coast of the South Island about 3/4 hour's drive north of Christchurch. Over 700 people live in the community, and there are a variety of services located there (e.g. schools, rural fire, life-saving club). It is also a popular holiday destination. The community is at risk from tidal surge, flooding, tsunami, earthquake and fire. Flooding is Waikuku's most commonly occurring hazard and the area has been subject to a number of floods as a result of the Ashley River peaking during weather events. As a consequence of Waikuku Beach's susceptibility a community response plan has been developed to build resilience and assist the community in responding to future events.

Objectives The purpose of the plan is to identify hazards that may impact on the Waikuku area and to provide a plan whereby the communities within are able to plan to respond and remain self-reliant for at least 72 hours without any outside assistance or until the Local Civil Defence Emergency Management agencies can assist. When an emergency occurs, the plan is activated by the community in response to the event, with other agencies activating their own plans. The plan is a vehicle for developing self-efficacy - the feeling that community members can do something to mitigate the effects of a disaster.

Process Following a moderate storm on August 2008 the Waikuku community was isolated due to flood waters cutting off the two access roads from the community. There was no community structure to deal with such an event if it should escalate. It was suggested by the EMO that the community needed to take responsibility for themselves and the plan was instigated.

The plan contains:

- Named members of the community who will respond to an event and their contact details.
- Management structure, and roles and responsibilities of the community response team
- Hazard maps
- Telephone trees
- Details on response arrangements
- A list of available local resources (e.g. equipment, expertise)
- A place for 'sign off' by community members.

Monthly meetings were held initially with the Community Management Team. The meetings aided the development of a community surveys that were aimed at gathering details on resources in the area. Following the return of the surveys, area coordinators and street volunteers were developed. Each meeting pushed for general preparedness as well as planning. These activities have been followed-up in 2010 with community training courses. The first course had an instructor along to teach fire risks, extinguishers and practical use of fire extinguishers. It is planned to introduce 4 other community courses covering basic first aid, basic rescue skills, two way radio communications, and CIMS over 2010.

Outcomes/Lessons:

In response to the tsunami warning from the Samoan Earthquake on 30 Sept 2009 the Waikuku Community Response Plan was activated. Civil defence emergency management informed local community volunteers who were part of the Waikuku Beach Response Plan, and the volunteers warned whitebaiters and people using the river and beach. People were told by the volunteers that they needed to leave the river and beach area by 11.00 am and they did so. The plan was activated and worked; testimony to the effectiveness of having a community-led response plan.

Good Practice:

- An emergency manager facilitated the development of response plan rather than wrote the plan itself, making it a community led plan. The administration and writing of the plan was sponsored by the territorial authority.
- The plan uses local people and resources as part of its response. These have been identified in a systematic way, by undertaking community surveys.
- People have been provided support and resources to undertake activities (e.g. training courses).
- The plan is a 'living document' evolving as new information comes to light, or details need updating.

Key/Critical success factors:

At Waikuku Beach the community response plan was 'sold' as something that would help the neighbourhood/community rather than being directly related to 'civil defence', and this had achieved greater buy-in as the idea of 'assisting the community' was more acceptable to people. Thus highlighting the multiple benefits that preparing can have. This can also be an important aspect, of building positive outcome expectancy as people are more likely to make preparations if they that undertaking the actions can have a direct and real benefit to themselves, outside of simply responding during an event.

Potential for replication:
The development of a response plan is something that many communities can undertake and can be a good forum for building self-efficacy in communities. Self-efficacy can also be built through other ways however, including encouraging participation in other hazard-related forums, and by ensuring that any information that is provided to communities is easily understandable and practical, so that people know exactly what they need to do to become more prepared.

3.0 OUTCOME EXPECTANCY

3.1 What is outcome expectancy?

Outcome expectancy (also known as response efficacy) is the perception of whether personal action will effectively mitigate or reduce a problem of a threat (Bennett and Murphy, 1997). There can be both positive and negative outcome expectancy:

3.2 Positive outcome expectancy

Positive outcome expectancy is the belief by a person that preparing will enable them to deal with any future hazard effects, and any actions they undertake will contribute to the quality of everyday life.

"I can deal with hazards and as a result there will be a good outcome"

3.3 Negative Outcome Expectancy

Negative outcome expectancy is the belief by a person that preparing will make no difference to dealing with any future hazard effects (i.e. the event will be too destructive or catastrophic for personal actions to be effective).

"Whatever I do, I can't make a difference"

3.4 Evidence for the importance of addressing outcome expectancy

People who hold strong positive outcome expectancy, and low negative outcome expectancy are more likely to engage in adopting preparedness measures. To build resilience, both negative and positive outcome expectancy beliefs need to be addressed by separate intervention strategies.

Positive outcome expectancy is influenced by a number of external factors including the level of understanding of hazard issues, perceptions of the causes of loss and damage, the relationship with actions related to mitigation, locus of control, and critical awareness. Low positive outcome expectancy has been linked with people perceiving the information they were given as inadequate, as it makes it difficult to understand what happens when a hazard event occurs, and thus reduces their perception of needing to prepare (D. Paton, 2007a). Positive outcome expectancy can influence empowerment, trust, articulation of problems and intention to prepare.

Negative outcome expectancy is influenced by thoughts that an event is uncontrollable, which is linked to a person having an external locus of control or they interpret hazard events in ways that preclude their perceiving how a measure can mitigate a specific threat. With a belief that they have no control over events this reduces a person's likelihood of preparing for a disaster. Negative outcome expectancy is also influenced by critical awareness (i.e., the frequency with which people think about and discuss hazard events with others) and fatalism.

3.5　　　Suggestions for addressing outcome expectancy

When looking at outcome expectancy, distinct measures need to be taken to (1) develop positive outcome expectancy and (2) reduce negative outcome expectancy.

3.6　　　Developing positive outcome expectancy

- The greater the general utility of a recommended activity or resource, the more likely it is to be adopted (Lindell & Whitney, 2000)
- Use community empowerment strategies
- Ensure the use of comprehensive communication strategies:
- e.g. Target at risk groups; use preferred media types; use many media types; use many credible sources; ensure adequately detailed information; provide information frequently; provide booklets with specific information and instructional pictures; provide different sources of information; have a performance target; monitor effectiveness (Finnis, 2004)
- Ensure that any education / information program outlines the complex nature of natural hazards, rather than focusing on widespread damage and destruction.
- Demonstrate that losses are avoidable, and show how people can practically avoid losses.
- Engender a belief in people that mitigation measures can be effective (McClure, Walkey, & Allen, 1999; Paton, 2006).
- Emphasise an immediate benefit from the protective action e.g. "It will save you money by reducing maintenance costs on your house"

3.7　　　Reducing negative outcome expectancy

Negative outcome expectancy can be reduced if public education and news media show that:
- Damage from an event, or potential event, is not universal and total. Remove the focus from 'awe-inspiring and catastrophic events' to focus on realities of an event (in terms of damage/loss).
- Show that the distribution of losses from an event is not evenly spread (i.e. impacts occur when communities are more at risk or more vulnerable).
- Show how the distribution of losses reflects factors about which people can make choices (e.g. building design, preparedness actions). Encourage people to see themselves as having control over events.
- More balanced and analytical articles (e.g. showing the relationship between hazard activity and how to cope).

3.7.1 Case Study

Title   Karori Civil Defence volunteers

Indicator   Outcome expectancy

Overview   The Karori Civil Defence volunteers are a well-established volunteer group located in the Wellington area. The volunteers work closely with the local community constable, Neighbourhood Support, and many of the schools, businesses, churches and other community groups in the suburb. The work of the volunteers is focussed on pre event planning and preparedness education, especially in the schools. Karori, as a suburb, is geographically isolated from the rest of Wellington, and will be cut off for weeks after a major earthquake event and much of the pre event planning is focussed on the identification of skills and supplies within Karori that will be necessary for their survival following such an event.

Objectives The objective of the Karori Civil Defence volunteers is to engage in pre event planning and preparedness education that will increase peoples positive outcome expectancy that mitigation measures can and will be effective in reducing the impact of a major earthquake.

Process   Through developing their own plans and involving the rest of the community in the planning process, the Karori Civil Defence volunteers are demonstrating their own positive outcome expectancy to the rest of the community. These actions include a programme developed for the Years 7 and 8 students at Karori schools, speaking to clubs and churches, and developing MOU's with businesses in the area. These activities have been developed over a number of years and engaging the community in this way is an on-going undertaking.

Outcomes/Lessons:
- Increasing outcome expectancy in community members is an on-going process
- Demonstrating through doing is an important part of increasing resilience

Good Practice:
- Linking in with other groups such as Neighbourhood Support and other community based groups and businesses
- Communicating the planning that has happened with the rest of the community

Key/Critical success factors:
- Committed community leaders who have a good understanding of both civil defence emergency management and their own community
- Committed volunteer members who have a wide range of skills.

Potential for replication:
The Karori Civil Defence Volunteers have developed to suit the needs of their own community. Successful Civil Defence Volunteer groups exist all over New Zealand, each group is different, and has evolved to suit the needs of their community. A positive Outcome Expectancy is essential for the groups to succeed.

4.0   CRITICAL AWARENESS

"Hazards are important, and I think and talk about hazards regularly"

4.1   What is critical awareness?

Critical awareness describes the extent to which people think hazards are important enough to:
(a) think about hazards; and
(b) conduct regular conversations about hazards with other people

4.2   Evidence for the importance of developing critical awareness

Critical awareness is an important predictor of preparedness. The degree to which people think and talk about hazards can influence people's understanding of hazard issues, and enhance motivation and preparedness (McIvor & Paton, 2007; Paton, Smith, & Johnson, 2005; Paton, 2003; Paton, 2007a; Paton, McClure, & Burgelt, 2006).

Critical awareness is a process that exists under normal, pre-disaster circumstances that involves reasoning about issues people perceive as critical or salient (Dalton et al., 2001). Discussions of hazard issues with others is an important process as it helps people understand hazard and preparedness-related issues and helps legitimise hazards as a salient issue (D. Paton, 2007a). The nature and frequency of discussions has been also linked to participation in community activities (D. Paton et al., 2006).

Critical awareness can be influenced by people's attitudes and beliefs (e.g. people might not talk about disasters and preparedness because it is not salient to them, doesn't match their beliefs of what they need to do). If it is not a 'social norm' they may also not think about or discuss hazards, as they might not feel that others approve of the discussion.

4.3   Suggestions for developing critical awareness

- Invite representatives of community groups to review hazard scenarios
- Encourage people to share real-life stories of experiences of dealing with and preparing for disasters.
- Get community leaders to lead discussions about hazards and preparedness;
- Have knowledgeable people available to share knowledge and experiences (e.g. scientists)
- Encourage involvement in local community activities and functions
- Organise activities in which community groups can get involved in discussions about hazards
- Make listening to people's experiences and ideas an important part of community meetings

4.3.1   Case Study

Title   Mt Lyford Community Resilience programme

Indicators Critical awareness

Overview In March and April 2009, Canterbury Civil Defence Emergency Management (CDEM) Group undertook a community engagement exercise around resilience in the North Canterbury resort town of Mt Lyford. Mt Lyford is an alpine village situated approximately 1½ hours drive north of Christchurch and 50 minutes from both Kaikoura and Hanmer Springs. Environment Canterbury had been pleased with the success of two previous community engagement exercises held in Christchurch: the Clean Heat and the Go Smart/Travel Smart projects. When it came time to find a way to get the Mt Lyford community engaged in a process of thinking about both personal and community preparedness, the Canterbury CDEM Group adopted a similar approach to those projects.

Mt Lyford is a small resort community established primarily to allow people access the nearby ski fields. Formerly a high country station, in 1986 owners Doug and Jenny Simpson decided that the high snow risk necessitated a change in the land use. They formed a partnership with Wilkins and Davies Ltd, a construction company, and the resort was born (Mt. Lyford Alpine Resort, 2000).

At the time of the 2009 community engagement project, most of the sections in the settlement had been sold and approximately two-thirds of the sections had homes built on them. Of the 120 houses built there only about 30 were occupied by full time residents. The village development has included roads, water supply, underground power and telephone services and the construction of a lodge.

The community is at greatest risk of fire and earthquake events. The Hope fault line runs right behind the village and the houses are nestled amongst trees and many are surrounded by tall grass. It is an isolated community with no petrol station.

Objectives The objective of the Mt Lyford project was to increase community resilience by motivating people to prepare for hazard events. Project organiser Bill Simpson thought that while the Get Ready/Get Through campaign was good at upgrading and maintaining people's hazard awareness, something more was needed to improve people's motivation to take action in the first place.

Process   At the Lyford Village there was already a very active civil defence volunteer co-ordinator. Using her contacts it was easy to enlist 17 households into the project, there are 30 households in the community and though more wanted to join, the limit of 17 was set by budgetary constraints.

A trained facilitator, experienced and qualified in adult education and civil defence volunteer instruction, visited each of the 17 households for a one hour conversation. The conversation was guided by a formal script. Three weeks later

the facilitator revisited the 17 households to check progress. From the 2 visits it was possible to record the changes of behaviour actually made in order to increase preparedness.

Discussions were scripted sessions that asked participants to personally assess and then improve their level of readiness for disasters and environmental change. Householders were asked to list the threats they though would potentially impact their household and their community. They were also given an open opportunity to comment on any other issues they thought were relevant to their community.

Good Practice:
The Mt Lyford project demonstrates good practice in critical awareness because it attempted to engage people to get them to think and talk about hazards and preparedness. Additionally Simpson (pers. comm., 2009) states, "You have to encourage people to find their own solutions".

Key/Critical Success Factors:
Critical to the success of this project was the small size of the community and its coherence.

Potential for replication:
The best prospects of success for this type of project will be a community that is coherent and one in which it is possible to identify a key coordinator who has a broad base of support across the community. It would most likely be well-replicated in a community that was small.

5.0   ACTION COPING

"I deal with problems by undertaking action directly (rather than worrying)".

5.1   What is action coping?

Action coping is a form of 'problem focused coping', and relates to peoples' ability to solve problems in life by confronting and resolving them.

5.2   Evidence for the importance of developing action coping

Problem focused coping has been found to predict resilience. Problem-focused coping describes actions taken to address the cause of a problem directly and is in contrast to emotion-focused coping, which indicates action taken to alleviate the negative emotions associated with a problem (Duval & Mulilis, 1999).

In the context of hazard preparedness, problem-focused coping encompasses taking actions to reduce the risk of damage or to minimize negative consequences of any damage that may be incurred. Therefore, people who deal with problems using problem-focused coping are more likely to prepare than those who use emotion focused coping.

Action coping in particular has an influence on intending to prepare (D. Paton, 2007a; Paton, Smith, Johnston, Johnston, & Ronan, 2003) It also influences community participation.

The number and quality of action plans, and the effort involved in risk reduction behaviours is strongly related to self-efficacy judgments (Bennett and Murphy, 1997).

5.3 Suggestions for developing action coping

- Include active problem solving as part of community participation / education and empowerment strategies (D. Paton, 2006).

5.3.1 Case Study

Title Youth Emergency Preparedness Programme (YEP)

Indicator Action Coping

Overview As part of their work to engage young people in Red Cross, Red Cross Dunedin Branch developed, in 2007, a programme called 'Youth Emergency Preparedness Programme' – or YEP. The programmes purpose is to involve youth in the organisation and provide young people with life skills. This programme has been running in Dunedin since early 2008. In 2010 it had 20 participants.

Objective The purpose of YEP is to provide young people (between the ages of 15 and 18) with skills to prepare for and cope with emergency situations within their community.

Process YEP runs over the first three terms of the Secondary School year. Training is held for two hours weekly with weekend camps/courses scheduled for once a term. There are a variety of topics covered in the YEP curriculum, Red Cross knowledge, bush craft, radio communications, first aid, navigation, search & rescue, disaster preparedness and rope rescue skills.

During the programme, participants develop a knowledge and skill set that will assist them in their ability to prepare for and cope with a variety of emergency situations.

The programme upholds part of the NZ Red Cross mission through "…mobilising the power of humanity and enhancing community resilience". YEP does this by providing training to young people in skills which will assist them, their families and wider community in an emergency situation.

Outcomes/Lessons:
YEP is in its third year of delivery in Dunedin and is now available to be run around New Zealand. Participants in the programme have learnt a wide variety of skills related to preparation of, and response to, emergency situations. Feedback from participants has been uniformly positive, with all stating that they are now confident in their ability to respond to an emergency, as well as being more engaged with emergency preparedness in their homes, schools and communities.

Good Practice:
- Offer concrete skills to participants, that have an application in 'real life' events (such as a car-crash, house fire or lost person), not just 'disasters'.
- Group participants with similar ages so that they can build friendships
- Help participants understand how they can always make a difference in their families and communities in an emergency

Key/Critical success factors:
- Involvement of the right partner organisations to support training (YEP relies on input from the Police, SARs, Fire Service
- Using the right trainers and programme coordinators to ensure that young people are engaged with the activities.

Potential for replication:
YEP has been developed as a programme that can be run right across New Zealand through the Red Cross.

6.0   COMMUNITY PARTICIPATION

"I actively participate in community activities"

6.1   What is community participation?

Participation describes the degree to which people take an active part in community life. Through community participation people can make a contribution to defining and achieving community goals. Participation might include volunteering time, money or resources to community activities, serving on local committees or groups, signing petitions, serving in public office, providing social support, grass roots efforts, or government mandated citizen participation (D. Paton, 2007a).

6.2   Evidence for the importance of developing community participation

Community participation in community activities and functions has been found to be a predictor of hazard adjustment in a variety of studies (Bishop, 2000; M. K. Lindell & Perry, 2000; Paton, 2006; Paton, Johnston, Smith, & Millar, 2001; Paton et al., 2006).

Benefits of participation include:-
- acquiring new information from discussions with people
- Learning new skills
- Being involved with important issues
- Making interpersonal contacts
- Personal recognition
- A sense of improving the community
- Building a sense of pride.

Community participation can influence self-efficacy, action coping, community competence, empowerment, trust and intention to prepare for disasters. Additionally, the more active the participation, and the more it is geared towards defining and resolving issues and problems, the more likely that collective problem solving skills can be developed (Paton 2007).

6.3   Suggestions for developing community participation

- Encourage hazard discussions within existing groups (e.g. schools workplaces)
- Integrate any resilience work with community development planning
- Use community empowerment strategies (see below)
- Encourage involvement in local community activities and functions
- Involve community leaders in emergency planning and other resilience activities
- Identify salient issues in a community and define the problems that need dealing with
- Enable activities to take place within the community e.g.:
  - Arrange a time and place to discuss hazards issues, and do this on a regular basis.
  - Don't be despondent if people are not so keen to engage at first, building trust takes time. Keep at it. (refer also section on *Trust*)
  - Additionally hazards and preparedness might not be the most important things to people (e.g. they might be more interested in crime or community sustainability) – make sure there is a way for addressing these issues (e.g. you have a representative there that can work with them or you have a time and place to focus on these instead).
  - Help people to undertake mapping exercises with the community. Show them maps of the area with hazards overlaid. Let community members show you around their neighbourhood and point out the things that are important to them, and where they see issues and problems. Encourage them to make their own map of these.
  - Affect change at an individual level, by visiting homes and working with individuals to prepare/become resilient.
  - Provide emergency training to groups

Work with schools as part of an integrated community programme:
- Visit schools and get students to participate in activities e.g. Talk to children about hazards in their area and how to prepare, put together a preparedness kit as a class, have an emergency exercise/drill so children know how to respond to an event.
- Homework- Get kids to talk about it and do activities with their parents (i.e. get prepared).
- Connect with other community-wide programmes, so it is not just a stand-along activity (for example, the ShakeOut Earthquake Drill in Southern California did this, see Becker, 2009).
- Integration of national resources (e.g. What's the Plan Stan) with EMOs and teachers. Check all are talking and working together to ensure resources get used.

6.3.1   Case Study

Title   Coast Care and Beach Care Initiatives
(based on Blackett and Hume, 2006; pers. comm. Jim Dahm, Economos, 2010).

Indicator Community Participation

Overview There are a number of Coast and Beach Care initiatives being run throughout New Zealand. The focus of these initiatives are 'communities caring for the coast' - including restoring sand dunes at beaches, re-vegetating dunes and enhancing biodiversity, landscape, natural character. Beach Care and Coast Care have a strong hazard management component as dunes play a very significant role in mitigation of coastal erosion, flooding, and the alleviation of tsunami hazard.

The Bay of Plenty Coast Care programme has been in operation since 1993/94 and was initiated by several enthusiastic people who observed partnership arrangements to re-vegetate and re-build dunes in New South Wales Australia. Coast Care began as a partnership between Environment Bay of Plenty (EBOP), Tauranga City Council and the community and has expanded to 28 Groups. Beach Care work also started in the Waikato Region in early 1993 and as well as focussing on dune restoration, also has building community resilience as a core aim. Beach Care in the Waikato Region works through partnerships between the local community, iwi, district councils and Environment Waikato. There are currently 16 community beachcare groups working on the east and west coasts of the Waikato region.

Objectives The vision of the Bay of Plenty group is "working with communities to protect and enhance the natural coastal environment". Beach Care groups in the Waikato Region share a similar ethos, with a desire to care for beaches around the region.

Process The Bay of Plenty group currently operates under a Coast Care advisory Group, which is made up of representatives from regional and territorial authorities and the Department of Conservation. The group meets regularly (every 6 weeks) at different beach sites to undertake dune plantings and general beach conservation activities. Likewise the Waikato based groups also meet regularly to undertake plantings and contribute to beach conservation efforts.

However activities are not limited to planting; a wide range of activities are associated with the Coast and Beach care initiatives including:-
- helping restore and maintain natural coastal ecosystems that provide natural hazard protection;
- various scientific and policy work (related to development setbacks and controls etc.);
- a wide range of community education and participation work aiming to build community awareness of the environments they live in and how these may be impacted by climate change;

- Civil Defence and their work in hazard awareness, preparation, prevention and recovery;
- scientific research (undertaken by crown research institutes, regional councils, etc.) making sure we understand the natural and human systems related to the coast.

Outcomes/Lessons:

The Coast and Beach Care groups have been very successful, with a large number of groups springing up and the maintained running of those groups over time.

Good Practice:
- Involvement of a facilitator especially at early stages of a group's formation to ensure that what they are doing is on-track. After this the facilitator can leave the group to manage themselves (empowerment).
- Provision of regular published information about the group's activities (e.g. newsletters, newspapers, signs on site, success stories of re-built dunes, etc.).
- Regular meetings and activities that the group can participate in.
- A wide range of activities to focus on, so the groups can evolve and continue to be interested in participating.
- Provision of resourcing to assist the groups (e.g. plants, material and expertise are provided, but not money).
- Funding is not contestable – it was felt that contestable funding may have brought about the demise of Australian groups, plus it makes it too complex for the community groups.
- An honest relationship between the facilitator and the groups.
- Maintenance of good links and relationships with expert assistance (e.g. local authorities, coastal scientists).

Key/Critical success factors:

Key success factors include:
- The involvement of a facilitator to assist groups, but groups being essentially empowered to manage themselves
- Resourcing to assist groups in their activities.
- Regular interactions and communications over time.
- A variety of activities for group members to be involved with.

Potential for replication:

Coast and Beach Care groups have been very successful in starting up and continuing to run over time. As they are involved with resilience building from a coastal perspective groups such as these could be approached to discuss and participate in other resilience and emergency management activities. Thus tapping into other successful initiatives, rather than setting up something new. Alternatively emergency managers could follow similar approaches in setting up community participation directly related to hazard issues.

7.0 ARTICULATING PROBLEMS

"I discuss and define problems, and help determine solutions for those problems"

7.1 What does the articulation of problems involve?

Articulating problems relates to the ability to describe community views, attitudes, needs and processes and how information is exchanged to derive common goals and meanings. It can include discussing and defining problems and determining solutions for those problems.

7.2 Evidence for the importance of developing an ability to discuss problems and determine solutions

As natural disasters are rare, people need to be able to define the kinds of issues they may have to contend with in the event of a disaster. It is therefore important to develop a capacity for individuals and community groups to identify and define salient issues related to hazards (D. Paton, 2007a).

As part of the process of defining problems, individuals will seek out information to clarify circumstances. Some of that information may be consistent with what they expect to find, but if not this can reduce trust in the source, and reduce the likelihood of further information seeking and clarification of the issues they face.

Articulation of problems is a social process and links with aspects such as critical awareness, trust community participation and empowerment. While community participation is an important part of the process, it will not automatically lead to a capacity to articulate problems (D. Paton, 2007a).   The ability to articulate problems must be targeted specifically.

7.3 Suggestions for developing the articulation of problems

- Involve community leaders and the community in general in emergency planning and other resilience activities
- Make use of community participation and empowerment strategies as vehicles for articulating problems
- Ensure that participatory activities include problem definition and resolution activities
- Encourage people to think and talk about hazards in ways that facilitate community members ability to identify and solve their own problems and implement solutions, with assistance and support from the CDEM sector.
- Let the community create its own solutions to the problem. (It's okay to make some suggestions about what they might want to do!) e.g. The community could:
  - Choose some leaders to arrange preparedness-related activities
  - Prepare individually or as a family
  - Undertake preparedness activities as a community (e.g. create stores for everyone or for households)
  - Take a stock take of resources available in the community that may be available during an event (e.g. Where is there a community garden we could use? Is there a source of water? Who owns tools that we could use after an event? Who is a trained medical professional or builder?)
  - Prepare response and/or evacuation plans (e.g. for tsunami)

- Undertake exercises (e.g. annually) to practise evacuation
- Undertake their own evaluation (e.g. by means of surveys).

7.3.1 Case Study

Title Kaitaia Community Response Plan
(see Mitchell et al., 2010 for additional information)

Indicator Articulating Problems

Overview Kaitaia, the northernmost town in New Zealand, is situated in the valley of the Awanui River. The Awanui River and Tarawhataroa Stream both flow through Kaitaia, and cause regular flooding. The town is also subject to other hazards including landslides, weather events, bushfire and pandemic. Given the propensity of the town to be affected by hazards, it was decided by local authorities that the development of a local community response plan would benefit the community.

Objectives The objective of the development of a community response plan was to:
- Provide a forum for the community to discuss hazard and response issues;
- allow the community to come up with their own valid plan of action; and
- encourage community participation in mitigating hazards.

Process An initial public meeting was held in 2006, at which time people in Kaitaia were informed about the upcoming formation of a community response plan and were invited to participate in the development process. A group was formed to develop the plan, with assistance from a consultant who would guide the process. The group consisted of members of the public, many of which represented key agencies (e.g. police, fire service). The group met to discuss the issues that Kaitaia faces and to find response-based solutions to these issues. The plan was drafted and put out to the community for consultation. The final plan was completed in early 2007.

Outcomes/Lessons:
A flood event in July 2007 occurred in Kaitaia and the response plan was used. Local authorities felt that it was 'invaluable' to have the plan for use in this event. Responders didn't necessarily read or pull out plan on day, but said the plan was 'in their heads' and could follow the actions they had agreed upon at the time of the plan development process. People did use phone numbers and contacts directly from the plan however.

Following the floods, group who wrote plan have met several times, and the plan has been updated to reflect any changes that need to be made as a consequence of using it during the floods.

Good Practice:
- Provision of forum for community discussion and participation over hazard issues
- Community-led plan, rather than led by local authorities.
- Provision of a consultant to facilitate and guide the plan development process, but not to write the contents of the plan per se.
- As well as responding to an event, have exercised the plan and identified any problems

in it that need changing.
- Updates of plan have been undertaken as required.

Key/Critical success factors:
- Community buy-in, both from key agencies and members of the public.
- The provision of a forum to discuss and solve hazard-related issues.

Potential for replication:
The development of a response plan is something that many communities can undertake and can be a good forum for getting people talking about hazard-related issues and finding solutions to any problems. The way the process is undertaken will be determined by the nature of the community (e.g. size, geographic nature, vulnerable groups, religious or ethnic groupings, etc.). However it does not need to be restricted to developing a response plan - other types of activities will also assist in getting communities to discuss and solve hazard-related issues.

8.0   EMPOWERMENT

"I can call upon personal and external resources, and deal with issues that arise"

8.1   What is empowerment?

Paton (2007) describes empowerment as "citizens' capacity to gain mastery over their affairs and to deal with issues and opportunities using intrinsic resources".

8.2   Evidence for the importance of developing empowerment

Empowerment is important in the context of disasters as people will need to draw upon their intrinsic resources when a disaster occurs. Empowerment is reflected in feelings by individuals that they can and do have an influence on what goes on in their community. Empowerment occurs through cooperative linkages between other individuals, the community and wider society. The empowerment process should be supported by external sources (e.g. CDEM), rather than led by them.

Empowerment strategies are driven by the goal of promoting the equitable distribution of resources (e.g. material, social, knowledge, peer helping, belongingness) to facilitate such ends as justice, equity, equality, respect for diversity, sense of community and the development of a collective capacity to confront local issues, whether of a hazardous nature or not (D. Paton, 2007a).

Empowerment influences critical awareness; outcome expectancy; self-efficacy; sense of community and response efficacy

8.3   Suggestions for developing empowerment

- Undertake community development programmes
- Target at-risk groups or groups with community influence e.g. schools
- Identify group needs
- Programmes should be carried out one at a time and have a specific objective
- Provide resources and mechanisms to facilitate community development and

empowerment.

- Enable community-led risk reduction, rather than institution led.
- Ensure that development is undertaken at all levels – individual, community and institutional (and integrated across different institutions) – to ensure resilience within all spheres.
- Make emergency training available to groups

8.3.1 Case Study

Title Northland Group Community Based Evacuation Planning

Indicators Empowerment

Overview The Northland Group has identified vulnerable communities in the region and through the local CDEM office has facilitated the development of community based planning. Civil defence volunteers work together to produce a "Community Response Plan" which details how that community will work together during an emergency. The plan can detail evacuation routes, designate welfare and registration centres, define community roles and identify warning systems according to what the community thinks is important in their planning.

Objectives To increase resilience through participation and empowerment community members

Process Community based planning requires the commitment of the institution to resource and support the community in their work. Building relationships with community leaders is essential as the first step in the community based planning process. Information sharing is vital in the planning process as both community members and council workers will have information vital for the hazard analysis. Accessible council CDEM workers is essential so the community

Good Practice:
Establish relationships before attempting to develop a plan
Let the community lead

Key/Critical success factors:
- Trust in the institution
- Not doing too much too fast

Potential for replication:
Community based planning is potentially able to be replicated in all vulnerable communities in New Zealand. Institutions can empower the community to develop its own resilience through facilitating community leaders to develop plans utilising their own resources to counter the vulnerabilities particular to their community.

9.0   TRUST

"I trust individuals, groups and organisations"

9.1   What is trust?

Trust is an important facet of resilience as it influences the effectiveness of personal relationships, group process and societal relationships, all of which are essential for developing an effective adaptive capacity. It is particularly important when the uncertainty associated with the timing, intensity, duration etc. of hazard events increases people's reliance on others for information and advice.

9.2   Evidence for the importance of developing trust

Research has found that people are more likely to adopt protective measures if they trust the source that is providing the information (Paton, 2007a, 2007b; Paton et al., 2006). People are also more likely to be supportive of civic agencies if they trust the way they manage risk, and think they are competent (Paton et al., 2006).

Trust is influenced by (Paton, 2007a, 2007b):
(a) an individual's previous experiences (e.g. prior hazard experience; dealings with institutions);
(b) structural and situational factors (e.g. informational social support, levels of participation in a community; existence of problem solving mechanisms)
(c) dispositional psychological factors (e.g. personality, coping style).

These factors interact to influence how people perceive the motives and actions of those upon whom they rely for things such as information and resources (Paton, 2007b).

Levels of trust depend on prior experiences. As hazard events are infrequent, trust may be based on other experiences people have had with an institution. For example, if they trust the local authority generally (based on other interactions with them), then people may trust civil defence emergency management as well.

Trust has links with coping style and self-efficacy judgements. People who trust information and organisations may be more likely to believe they can do something about hazards, and undertake practical actions to prepare. Involving the community in decision-making (community participation and empowerment) will build trust in both hazards information and in organisations involved in hazard planning.

Trust issues can arise when people think (Paton, Johnston et al., 2001; Paton et al., 2006):
• an agency may be withholding information (e.g. to protect economic or business interests; to stop criticism; or so they don't have to manage the risk);
• expenditure of hazard mitigation by civic agencies is unnecessary;
• information is incomplete or inconsistent from their own view, or from information they have found elsewhere;
• levels of risk and vulnerability are inequitable across communities;
• they are not involved in decision-making processes.

9.3 Suggestions for developing trust

- Communities need to trust any hazard/risk information source and this is linked to the degree to which people perceive agencies are empowering them (see above),
- Communities need to trust that expenditure on hazard mitigation has been based on sound decision making and is necessary,
- Any hazard / risk related information should be consistent,
- The community should have a feeling of equity and fairness regarding the distribution of risk and mitigation actions,
- Involvement and engagement should be undertaken with the community in decision-making about risk / risk reduction (D. Paton, 2006).

9.3.1 Case Study

Title Ruapehu Lahar

Indicator Trust

Overview In 1953 A crater lake breakout lahar was generated from Mount Ruapehu. This lahar travelled down the Whangaehu Valley and destroyed the railway bridge along the Main Trunk line. The Wellington-Auckland Express train arrived just after the destruction of the bridge and plunged into the Whangaehu River resulting in the death of 151 people. Such a terrible disaster destroyed people's belief in the ability of agencies to manage such events. Thus when Ruapehu erupted in 1995-96 depositing a tephra dam which the Crater Lake filled up behind threatening of a lahar, central government faced a challenge over how to manage such an event, and how to gain the trust of agencies and the public.

In this case study there are two elements of trust. One relates to local agencies trust in central government and between themselves; and the other relates to these agencies needing to build the public's trust in them being able to manage the response to such an event effectively.

Objectives Trust needed to be built in both agencies and the public so that people would (a) understand what the hazard was; and (b) people would respond effectively to a lahar event.

Process The development of trust occurred gradually as the issue passed through a number of stages. First the lahar received minimal attention in the years 1996-1999 as the hazard was assessed and an Assessment of Environmental Effects undertaken. Following this, the option was chosen not to intervene and remove the tephra dam, and there was much debate within central and local government circles and the community over this option. The debate ended when financial assistance was granted to develop an emergency response plan.

Once it was decided to develop an emergency response plan there was a formation of partnerships between responding organisations, namely the Northern and Southern Ruapehu Lahar Groups. These organisations worked together to develop a plan and to provide information to the public about the lahar hazard and the potential response.

Outcomes/Lessons:
When the lahar occurred in March 2007, the response went smoothly. In general the responding organisations worked together well, and the public followed the recommended actions (e.g. stop at road closed signs). A great deal of this success can be attributed to the relationships that were built and fostered before the event.

As building trust is a long term process there are still opportunities to continue to work with local communities with respect to hazard management and education (e.g. continue to build relationships with iwi over management of the lahar hazard; continued education with respect to the hazards posed by Mt. Ruapehu).

Good Practice:
There are a number of elements of good practice in this case study, including:
- The building of partnerships between organisations in planning for a response to the lahar.
- Formation of a specific Lahar Information Group. This group was an offshoot of the Southern Planning Group and its objective was to speak with a common voice to disseminate good, accurate, timely and consistent information to the public. The LIG produced brochures, warning signs, issued press releases and undertook other activities.
- On-going communication and interaction with the public.
- Commitment of resources by central government to assist with the planning process.

Key/Critical success factors:
Critical success factors include:
- Organisations were committed to finding a solution for the cause.
- Interaction with the public and iwi.
- Consultation with stakeholders over how to manage the lahar response. Regular meetings were held with Stakeholders, early on and close to the event. Stakeholders also received regular updates on the status of the lahar.
- A variety of information disseminated to the public in different formats. Presentations were given to schools, clubs and special-interest groups in Turangi, Taihape and Ohakune. Use was made of pictures, maps and anecdotes about Tangiwai, to illustrate what a future lahar might be like. The talks reassured people about the nature of the lahar and the intended response. Annual meetings were held with communities up the Whangaehu River Valley. Websites and information phone lines set up to provide lahar information.
- Individuals played key roles in disseminating information, particularly to the media. They were frequently called upon to discuss their 'side' of the argument.
- The issue was a salient topic of discussion – it was frequently brought up amongst the media (if somewhat sporadically over the years), agencies, and the public. Sometimes the media could be difficult to work with, perhaps due to misinterpretation of the lahar issue, resulting in negative coverage. Framing within the media also differed depending on the timeframe. In earlier years the media focussed on the disaster aspects of the lahar, while in later years media reported on the response aspect.
- The issue continued over a long timeframe (10 years) allowing, the issues to be worked through.

Potential for replication:

While the 2007 Ruapehu lahar event was a stand-alone event that could be forecast over a 10 year period, there are still lessons that can be learned in terms of building trust and resilience. The case study demonstrates the length of time that is needed to foster trust in communities. It also shows some important elements of trust building including strong partnerships, regular communications, openness about information, regular provision of information from multiple sources, and interaction with the community.

10.0   RESOURCES

10.1   What are resources?

Resources are important for helping create resilient communities, as resources can assist in community members achieving their goals. Resources don't have to be monetary - they can include human resources, non-financial resources and volunteers. In the Coast Care case study mentioned previously, communities were provided with non-monetary resources (e.g. expert advice, plants) which assisted their groups in being able to successfully undertake the activities they desired to do.

10.2   Evidence for the importance of ensuring resources are available

Research shows that depending on the amount and type available, an individual, community or institutions' resources may either limit the effectiveness or contribute to the success of building adaptive capacity (Lindell & Whitney, 2000; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Paton, 2006).

10.3   Suggestions for ensuring resources are available

- Assist with providing resources to community groups so that they can carry out their desired activities. These might include:
  - Providing direct funding from the CDEM or local government sector
  - Providing staff time and assistance in helping develop activities
  - Assist groups to apply for relevant funding
  - Work with other agencies that might be able to assist in acquiring disaster resources (e.g. community agencies that can help lower-socio economic communities develop a store of food/water, or provide access to a store of food water in an emergency.)
  - Work with commercial partners who may be able to provide donations for communities' use (e.g. hardware stores may be able to provide earthquake latches).

It might be worth starting from some achievable resources. What do we have available already that we could contribute or draw from? Resources availability might grow as activities grow momentum.

11.0 WHERE DOES COMMUNICATION AND MESSAGING FIT WITHIN ALL THIS?

A significant body of research already exists on communicating hazard information, its relationship to preparedness and the implications for public education. A number of studies have pointed out that there is no direct link between providing information on hazards and making preparations for hazardous events (Lindell & Whitney, 2000; McClure et al., 1999; McIvor & Paton, 2007; Mulilis, Duval, & Lippa, 1990; Paton, 2005; Paton, 2006; Paton, Daly, Parkes, Myburgh, & Smith, 2006; Paton et al., 2006; Paton et al., 2000; Ronan & Johnston, 2005; Ronan, Johnston, & Paton, 2001). Several studies also suggest that providing hazard information without any other supporting strategies may even serve to decrease community preparedness (e.g. Ballantyne et al., 2000; Johnston et al., 1999).

Such studies provide good evidence that communicating information as a sole strategy will not be a strong influence on whether people take action and become prepared. Rather, hazard information needs to be considered as part of a wider model, where it is integrated and connected with identified key indicators. It is important to:

- Ensure CDEM communication is integrated with general public education and community development strategies, to get best bang for the buck. Adapt strategies at the CDEM/local authority level to reflect this.
- Evaluate current messaging – does it reflect recommendations made by research? If not, change the messaging to reflect this
- Ensure messages are clear, consistent and coming from multiple sources.
- Expand your understanding and application of public communication and messaging. It is important to give well founded messages but they need to be within an overall framework of community participation and empowerment. Information can also include people talking about hazards/preparedness, images of people preparing and general environmental cues.
- Be transparent and honest about the risk posed by hazards in an area and the resources (e.g. funding, etc.) available to communities to mitigate those hazards.

Messages need to reflect:

- Preparing is a social norm (everyone does it, your neighbour does it, why haven't you done it?)
- You CAN do something about this problem, even small things help!
- You will get some benefit out of preparing (e.g. you will survive; it will save you money in the long run)
- Specific actions – so people know exactly what they need to do.

12.0   BEING A POLICY AND PROGRAMME ENTREPRENEUR!

Evaluation is an important part of an education programme and should be undertaken to assess the effectiveness of the content process and outcomes of a programme (O'Sullivan, 2004; Rohrmann, 2000).

It is important to carry out long-term evaluation research as it is only by measuring resilient indicators over several years that it will be possible to see if a particular locality is moving toward a state of increased resilience. A long-term programme will also assist in evaluating whether communication and education strategies are working, and can help identify what changes need to be made to make them work better. This will contribute to the development of a cost-effective approach that can more readily tailored to the needs of different communities.

Evaluation research should ideally begin before a programme has been implemented, to get baseline data on where the community sits currently, and to have something to compare to after the programme has been put in place.

In addition, resilience and adaptive capacity is evolving in nature over time. Any communication strategies and education programmes employed will modify the make-up of resilience in the region. This means that education and engagement strategies will also need to evolve to match the needs of the community. It is only by continually measuring resilience as part of a long-term programme that it is possible to know exactly how intervention strategies should be tweaked to ensure the evolving nature of resilience is incorporated.

Evaluation could be done at the CDEM level, or at community level, e.g.
Indicator surveys could be conducted at a CDEM level to measure change
* The communities could be empowered and trained to undertake their own evaluation, though use of minor surveys or qualitative (interview work) work.

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Ronan, K. R., Johnston, D. M., & Paton, D. (2001). Communities' understanding of earthquake risk in the Hawke's Bay and Manawatu-Wanganui regions, New Zealand. In *NZSEE 2001 Conference* (Vol. Paper No. 1.03.01, pp. 1 - 10).

Simpson, B., pers. comm. (2009) Mt Lyford Resilience Project.

APPENDIX 1   RESOURCE GUIDE: RELEVANT PUBLICATIONS

Creating a Resilient New Zealand
Finnis, K. (2004). Creating a resilient New Zealand: Can public education and community development campaigns create prepared communities? : University of Otago for the Ministry of Civil Defence and Emergency Management.
Available on: http://www.civildefence.govt.nz/

Tephra Article
Daly, M., Becker., J., Parkes., B., Johnston, D., Paton, D., (2009). Defining and Measuring community resilience to natural disasters: A case study from Auckland. Tephra, 22: 15-20.

Disaster Resilience. An Integrated Approach
Paton, D., & Johnston, D. (Eds.). (2006). Disaster Resilience. An Integrated Approach. Springfield, Illinois: Charles C. Thomas.

Community Resilience in Disasters
Ronan, K. R., & Johnston, D. M. (2005). Promoting Community Resilience in Disasters: Springer.

APPENDIX 2   RESILIENCE MEASUREMENT TEMPLATE

Note: Insert the particular hazard/disaster you wish to ask about e.g. earthquakes

Section 1   Personal Indicators

CRITICAL AWARENESS

8.   In regard to what happens in your *community,* please describe the extent to which you agree or disagree with each of the following statements:

	Once a week or more	A few times a month	Once a month	A few times a year	Rarely	Never
I think about [hazard/ disaster] issues and problems in my community	☐6	☐5	☐4	☐3	☐2	☐1
I talk about [hazard/disaster] problems and issues with others in my community	☐6	☐5	☐4	☐3	☐2	☐1

ACTION COPING

9.   In regard to how you normally deal with any problem in your *life*, please describe the extent to which you agree or disagree with each of the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I try to come up with a strategy about what to do	☐5	☐4	☐3	☐2	☐1
I make a plan of action	☐5	☐4	☐3	☐2	☐1
I think hard about what steps to take	☐5	☐4	☐3	☐2	☐1
I think about how I might best handle the problem	☐5	☐4	☐3	☐2	☐1

NEGATIVE OUTCOME EXPECTANCY

10.   Please describe the extent to which you agree or disagree with each of the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
[Disasters] are too destructive to bother preparing for	☐5	☐4	☐3	☐2	☐1
A serious [disaster] is unlikely to occur during my lifetime	☐5	☐4	☐3	☐2	☐1
Preparing for [disasters] is inconvenient	☐5	☐4	☐3	☐2	☐1
It is difficult to prepare for [disasters]	☐5	☐4	☐3	☐2	☐1

POSITIVE OUTCOME EXPECTANCY

11.   Please describe the extent to which you agree or disagree with each of the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Preparing for [disasters] will significantly reduce damage to my home should a [disaster] occur	☐5	☐4	☐3	☐2	☐1
Preparing for [disasters] will improve my everyday living conditions	☐5	☐4	☐3	☐2	☐1
Preparing for [disasters] will improve the value of my house/property	☐5	☐4	☐3	☐2	☐1
Preparing for [disasters] will improve my ability to deal with disruptions to family/community life following a [disaster]	☐5	☐4	☐3	☐2	☐1

SELF-EFFICACY

12.   In regard to the issues and problems you deal with in your *everyday life*, please describe the extent to which you agree or disagree with each of the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel I have control over the things that happen in my life	☐5	☐4	☐3	☐2	☐1
There is no way I can solve some of the problems I have by myself	☐5	☐4	☐3	☐2	☐1
I can't do much to change what happens in my life	☐5	☐4	☐3	☐2	☐1
Somehow problems in my life usually solve themselves	☐5	☐4	☐3	☐2	☐1

Section 2   Community

COMMUNITY PARTICIPATION

13.   In regard to participating in life in this *community*, please describe how often you undertake each of the following.

	Often	Sometimes	Rarely	Never
I have worked with others on something to improve community life	☐4	☐3	☐2	☐1
I participate in local activities or events (e.g., festivals, fetes, fairs)	☐4	☐3	☐2	☐1
I have contributed money, food or clothing to local causes, charities, or to others in my community	☐4	☐3	☐2	☐1
I have attended a public meeting on a community issue	☐4	☐3	☐2	☐1
I have been involved in volunteer activities intended to benefit my community (e.g., fundraising, clean-up days, local groups, Scouts/Brownies).	☐4	☐3	☐2	☐1

ARTICULATING PROBLEMS/LEADERSHIP

14. **In regard to your general feelings about living in this *community*, please describe the extent to which you agree or disagree with each statement. When responding to this question, community refers to a group of which you are a member and which is important to you. This could be your neighbourhood, church, neighbourhood watch, social or sporting group etc.**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
People around here will express an opinion even though they know it will be unpopular	☐5	☐4	☐3	☐2	☐1
When it comes to saying something in front of a group, most people in this community will do it	☐5	☐4	☐3	☐2	☐1
When people are needed to stand before a group of outsiders to tell them what this community needs, most people here could do it	☐5	☐4	☐3	☐2	☐1
In community meetings, I am often a leader	☐5	☐4	☐3	☐2	☐1
In community meetings I prefer to be a leader rather than a follower	☐5	☐4	☐3	☐2	☐1
In community meetings, I prefer others to take over the leadership role	☐5	☐4	☐3	☐2	☐1
What a community talks about depends on what residents are interested in	☐5	☐4	☐3	☐2	☐1
Struggles always occur to determine what issues this community should focus on	☐5	☐4	☐3	☐2	☐1
Community perceptions of issues depend on the quality of the individuals in that community	☐5	☐4	☐3	☐2	☐1
How people think about community problems controls what is done about those problems	☐5	☐4	☐3	☐2	☐1

Section 3   Institutional Level Indicators

EMPOWERMENT

15.   In regard to what happens in the wider community, in general, to what extent do you think that:

	Always	A great deal	Sometimes	Not very much	Not at all
Voting in local elections influences what happens in my community	☐5	☐4	☐3	☐2	☐1
Voting in local elections helps solve local problems	☐5	☐4	☐3	☐2	☐1
Community groups can get something done about local problems	☐5	☐4	☐3	☐2	☐1
I feel that I can influence what happens in my community	☐5	☐4	☐3	☐2	☐1
I feel that I see positive results from participating in community activities	☐5	☐4	☐3	☐2	☐1
I feel that I have an active part in keeping this community going	☐5	☐4	☐3	☐2	☐1
I care about my community's appearance	☐5	☐4	☐3	☐2	☐1
I feel that what happens in this community can affect my life	☐5	☐4	☐3	☐2	☐1
I have strong opinions about the way things are done by elected representatives	☐5	☐4	☐3	☐2	☐1
I think that elected representatives seriously consider my opinions	☐5	☐4	☐3	☐2	☐1
I think that elected representatives try to influence what goes on in my community	☐5	☐4	☐3	☐2	☐1

TRUST

16. **In regard to your general feelings about living in this *community*, please describe the extent to which you agree or disagree with each statement.**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I trust my Local Council to respond to meet the needs of its residents	☐5	☐4	☐3	☐2	☐1
I trust the community leaders in my community	☐5	☐4	☐3	☐2	☐1
I trust the media (newspapers, TV, radio) to report fairly	☐5	☐4	☐3	☐2	☐1
I trust my Local Council to do what is right for the people they represent.	☐5	☐4	☐3	☐2	☐1
I have confidence in the law to protect and maintain order in my community	☐5	☐4	☐3	☐2	☐1

Section 4: Preparedness

INTENTION TO PREPARE

17. **In the next month or so, do you intend to (please circle as appropriate):**

	No	Possibly	Definitely
Check your level of preparedness for [disasters]	1	2	3
Increase your level of preparedness for [disasters]	1	2	3
Become involved with a local group to discuss how to reduce [disaster] damage or losses	1	2	3
Seek information on risk from [disasters]	1	2	3
Seek information on things to do to prepare	1	2	3

PREPAREDNESS MEASURES

18.   The following are things that can be done to minimise damage and disruption if a [disaster] occurs. In regard to your household, please record whether you have done this, whether you may do this, or whether you will not do this.

	Have done this	May do this	Will not do this
I have considered the risk of a major [disaster] when deciding to live in the house that I do now	☐3	☐2	☐1
I have fastened tall furniture to the wall	☐3	☐2	☐1
I have fastened my hot water cylinder	☐3	☐2	☐1
I have either strengthened my chimney, or satisfied myself that it will not fall down in a major earthquake	☐3	☐2	☐1
I have either strengthened my house to increase its earthquake resistance, or satisfied myself that it will probably not fall down in a major earthquake	☐3	☐2	☐1
I have ensured that my roof will probably not collapse in a major earthquake	☐3	☐2	☐1
I have arranged the cupboards so that heavy objects are stored at ground level	☐3	☐2	☐1
I have securely fastened cupboards with latches	☐3	☐2	☐1
I have ensured that objects that contain water have not been stored on top of electrical equipment (e.g., a pot plant or fishbowl on top of the television)	☐3	☐2	☐1
I have ensured that heavy objects are stored on the floor	☐3	☐2	☐1
I have stored water for survival	☐3	☐2	☐1
I have put aside spare plastic bags and toilet paper for use as an emergency toilet	☐3	☐2	☐1

	Have done this	May do this	Will not do this
I have accumulated enough tools to make minor repairs to the house following a [disaster]	☐3	☐2	☐1
I have obtained a supply of tinned or dehydrated food that could be used in an emergency	☐3	☐2	☐1
I have purchased or put together a first aid kit	☐3	☐2	☐1
I have a supply of essential medicines for illness or allergies	☐3	☐2	☐1
I have obtained a working battery radio (or solar/ dynamo equivalent)	☐3	☐2	☐1
I have obtained a working battery torch (or solar/ dynamo equivalent)	☐3	☐2	☐1
I have secured moveable objects in my home (e.g., TV, computer)	☐3	☐2	☐1
I have access to an alternative cooking source (e.g. gas barbeque)	☐3	☐2	☐1
I have a household [disaster] emergency plan	☐3	☐2	☐1
My plan covers where the family should meet if an [disaster] occurs during the day	☐3	☐2	☐1
I have obtained a working fire extinguisher	☐3	☐2	☐1
I have taken some steps at work	☐3	☐2	☐1
I have obtained spare batteries for the appliances I might need to use	☐3	☐2	☐1
I have specifically put together an emergency kit	☐3	☐2	☐1
I check the contents/operation of my emergency supplies at least every six months	☐3	☐2	☐1
I have at least 3 litres water (in plastic containers) per person, per day for three days	☐3	☐2	☐1
I have 3 days supply of dehydrated or canned food	☐3	☐2	☐1

Demographic Information *(please circle a response as appropriate)*

Please be aware that all the information you provide us with is anonymous and we will only use this information to improve emergency preparedness in your community.

19.   What is your gender? (Tick only one)

☐1   Male   ☐2   Female

20.   Into which age bracket do you fall? (Tick only one)

☐1   18-19 yrs   ☐2   20-24 yrs   ☐3   25-29 yrs
☐4   30-34 yrs   ☐5   35-39 yrs   ☐6   40-44 yrs
☐7   45-49 yrs   ☐8   50-54 yrs   ☐9   55-59 yrs
☐10   60-64 yrs   ☐11   65-69 yrs   ☐12   70-74 yrs
☐13   75-79 yrs   ☐14   80-84 yrs   ☐15   85 years +

21.   Which ethnic group do you belong to? (Tick the box or boxes that apply to you)

☐1   New Zealand European   ☐2   Māori
☐3   Samoan   ☐4   Cook Island Maori
☐5   Tongan   ☐6   Niuean
☐7   Chinese   ☐8   Indian
☐9   Other (e.g., Dutch, Japanese) **(Please specify):**_____

22.   What is your main occupation? (Tick only one)

☐1   Employed: What is your job?_____
☐2   Unemployed
☐3   Retired
☐4   House person
☐5   Student: What are you studying? _____
☐6   Other **(Please specify):** _____

23.   What is your highest educational qualification? (Tick only one)

☐1   No school qualifications
☐2   Secondary school qualifications
☐3   Trade certificate or professional certificate or diploma
☐4   University undergraduate degree (e.g., diploma or bachelor's degree)
☐5   University postgraduate degree (e.g., Master's, Ph.D.)
☐6   Other **(Please specify):** _____

Information about your household

24. **How long have you lived in your current house?** _____ **year/s**

_____

25. **Which of the following best describes your household now? (Tick only one)**

☐₁ A couple without children
☐₂ One person household
☐₃ Two parent family with one child or more
☐₄ One parent family with one child or more
☐₅ Non family household (e.g. flatting)
☐₆ Other. Please state: _____

26. **Do you, or someone in your house, own or rent the home you live in?**
(Tick only one)

☐₁ Own or buying, to live in it
☐₂ Own or buying, but only for use as a holiday home
☐₃ Rent, to live in it
☐₄ Rent as a holiday home
☐₅ Other **(Please specify):** _____

27. **What was your household's total income (before tax) for the 2007 financial year (April 1 2007-March 2008)? (Tick only one)**

☐₁	Loss	☐₂	Zero Income
☐₃	$1 – $5,000	☐₄	$5,001 – $10,000
☐₅	$10,001 – $15,000	☐₆	$15,001 – $20,000
☐₇	$20,001 – $25,000	☐₈	$25,001 – $30,000
☐₉	$30,001 – $35,000	☐₁₀	$35,001 – $40,000
☐₁₁	$40,001 – $50,000	☐₁₂	$50,001 – $70,000
☐₁₃	$70,001 – $100, 000	☐₁₄	$100,001 or more