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PROPOSAL FOR MEASURING COMMUNITY RESILIENCE IN THE CANTERBURY CDEM GROUP AREA

Prepared for:

Canterbury Emergency Management Office

14 September 2007

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PROJECT OBJECTIVES

The overall objective of this study is:

- To measure baseline indicators of community resilience for the Canterbury CDEM group area, which can then feed into the development of appropriate intervention programmes designed to enhance preparedness and resilience in the region.

OUTLINE OF THE PROJECT

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 during and after a disaster.

Research has shown that a number of community, individual and institutional attributes can be used as indicators of preparedness and resilience. These indicators include outcome expectancy, action coping, articulation of problems, community participation, empowerment, trust and self-efficacy (Figure 1). By working to develop these characteristics within a community, we can influence the way our communities prepare for, respond to and recover from disasters.

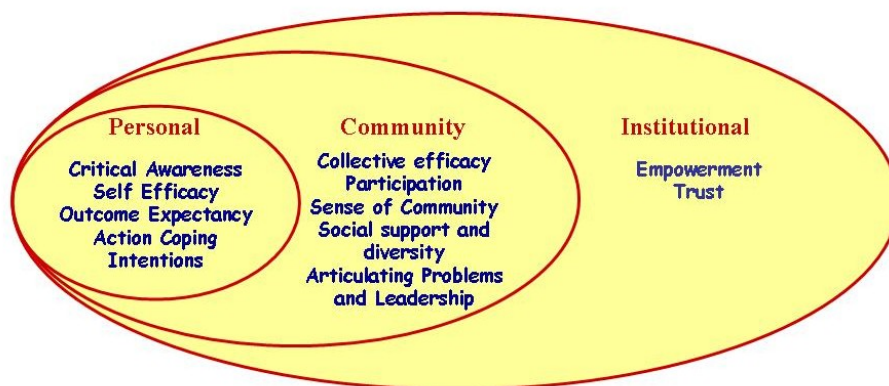


Figure 1. Indicators of preparedness and resilience.

It is possible to measure the indicators shown above, and link this information to how prepared and resilient a community is currently. To date, we have measured these indicators 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.

Measurements of the indicators can be taken before 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.

METHODOLOGY

Community Survey

We propose to use a general survey design to collect measurement data from households about resilience and preparedness. A questionnaire will be developed to collect quantitative data specifically on community resilience indicators and tangible measures of preparedness.

Development of the questionnaire will be undertaken in collaboration with the Canterbury Civil Defence Emergency Management Group, its member authorities and partner organisations. To give participants' a focus, it is suggested that we use only one hazard as reference for the survey, namely the earthquake hazard. The findings from a survey on earthquake preparedness and resilience will still be generally applicable for other hazards.

The survey will collect quantitative baseline data which can be revisited as part of future survey measurement work to test the effectiveness of education campaigns and engagement strategies.

In terms of survey delivery, the locations of where surveys will be delivered to will be determined in consultation with members of the Civil Defence Emergency Management Group and/or other stakeholders, however our suggestion is:

- 1,000 surveys delivered in the greater-Christchurch area
- 1,000 surveys delivered in Timaru
- 500 surveys delivered in another smaller town or rural area (e.g. – Mackenzie to Hurunui districts).

Ethics approval will be obtained through Massey University before questionnaires are distributed.

METHOD OF DELIVERY

A random sample of addresses will be obtained and questionnaires mailed to households located at properties in the selected communities. Where this is not possible, questionnaires will hand-delivered to a random selection of properties.

To increase response rate, two weeks after the delivery of the questionnaire a reminder letter and replacement questionnaire will be posted to those households who have not returned the questionnaire, again inviting them to participate.

ANALYSIS

On receipt of the questionnaires, the data will be coded, entered and analysed using the Statistical Package for the Social Sciences (SPSS) program.

Qualitative Interviews

To date, there has been very little in depth study on how individual, community and societal factors interact to determine how people render hazard information meaningful, and how this process translates into preparedness actions. In order to gain a deeper understanding of the details of how and why people become more resilient at an individual level, we propose to undertake a series of interviews with community members living in Timaru. The interviews will provide more detail about how to enhance resilience and will contribute to the development and evaluation of intervention strategies.

Approximately 20 interviews will be undertaken with people living in the Timaru area. Interviews will be unstructured to allow participants to talk freely about the reasons why they do and don't prepare. Data collected will be analysed using a method appropriate for qualitative analysis. Reference will be made back to the resilience measurement questionnaires sent out for comparison.

Focus groups will also be conducted in the survey areas where interviews are not conducted (e.g. greater-Christchurch, rural communities) to collect qualitative information about preparedness processes in those areas.

Ethics approval will be obtained through Massey University before interviews are arranged and conducted.

Workshop

A workshop will be held with the CDEM Group and other relevant stakeholders early in 2009 to discuss the results of the quantitative and qualitative research, and provide recommendations for future education and intervention strategies.

LINKAGES

This research is being undertaken as a part of a collaborative effort with funding contributions from the Foundation for Research Science and Technology (FRST), the Ministry of Civil Defence and Emergency Management (MCDEM) and the Canterbury CDEM Group. The FRST project will contribute \$50,000 for this study, the Ministry of Civil Defence and Emergency Management is contributing \$20,000 and we are seeking a contribution of \$10,000 per annum of co-funding from the Canterbury CDEM Group as a contribution of costs to the project.

The Timaru survey and Timaru interviews will form part of a PhD project being undertaken by Julia Becker at Massey University/GNS Science. It is anticipated that all data collected during the Timaru phase will be used in the analysis and write up for the PhD dissertation, as well as for measuring and enhancing resilience in the Canterbury CDEM Group area.

COSTS

All costs are quoted in New Zealand dollars and are expressed exclusive of New Zealand Goods & Services Tax.

As mentioned previously, this research is being undertaken as a part of a collaborative effort with funding contributions from FRST, MCDEM and Environment Canterbury. The FRST project and MCDEM will contribute a total of \$70,000 for this work, and we are seeking a total of \$20,000 of co-funding from the Canterbury CDEM Group to undertake the relevant outlined project over two financial years (2007-2008 and 2008-2009).

Total Canterbury CDEM Group contribution: \$20,000 + GST (to 30 June 2009)

TIMELINE

The costs listed above for the project only cover the first (baseline) survey and interview data collection, analysis and reporting (to December 2008). However we have outlined a longer programme of measuring resilience to show where intervention programmes and subsequent resilience measurements may fit within a wider timeline.

First resilience measurement cycle:

Target dates	Period	Time
Ethics application & approval	Nov - Dec 2007	2 months
Interviews in Timaru	May 2008	2 months
Interview data analysis	June-July 2008	2 months
Questionnaire development	Aug 2008	1 month
Questionnaires delivered	Sept-Oct 2008	2 months
Questionnaire data analysis	Oct-Dec 2008	2 months
Workshop with CDEM Group	Early 2009	1 day
Draft report	March 2009	3 months
Final reporting	June 2009	3 months

Development and delivery of intervention / education programmes (by Canterbury CDEM Group): Early 2009 – early 2010

Second resilience measurement (future potential research):

Re-interviews	late 2010	2 months
Interview data analysis	late 2010	2 months
Questionnaires delivered	early 2011	2 months
Questionnaire data analysis	2011 - 2012	2 months
Reporting (draft and final report)	2011 - 2012	6 months

Refinement and continued improved delivery of intervention / education programmes (by Canterbury CDEM Group): 2012-2013

OUTPUTS

The outputs from this study include:

- An understanding of the current resilience and preparedness of communities in the Canterbury CDEM Group area;
- A baseline measurement of resilient indicators which can then be measured in future surveys to see whether resilience is improving or not;
- A detailed understanding of the reasons why people do and do not prepare (from interviews).
- Suggestions for the direction of future education and intervention strategies.

There will be one final report combining the data gathered from the survey with the interviews undertaken in Timaru. The report will focus on current resilience in the Canterbury CDEM Group area, a baseline measurement of the resilient indicators and suggestions for the direction of future education and intervention strategies. As part of the report we will supply a non-technical summary that can be made available to those participating in the study, the Civil Defence Emergency Management Group, Regional and District Councillors, Regional and District Council and partner organisation staff, and any interested members of the general public.

PROJECT MANAGEMENT

This project will be managed by Julia Becker, who has wide experience in social science research, project management and research into other hazard-related and environmental issues. Julia will be responsible for all reporting on the project, and liaison with Jon Mitchell.

The researchers contributing to this project have extensive involvement with other current and future hazard related research which will feed directly into this study. In particular the GNS hazards and society programme, funded by FRST has several projects looking at the social impacts of hazardous events.

APPENDIX I: TEAM BIOGRAPHIES

Julia Becker, GNS Science, Lower Hutt

Julia studied both natural hazards and resource management to tertiary Masters level before becoming part of the team at GNS in 2000. She has also completed studies in social science research, and is currently undertaking a Phd. Julia has experience in conducting social surveys which look at people's perceptions and awareness of social, environmental and hazard issues. Currently she is involved with research into enhancing community resilience and effective planning and policy for natural and environmental hazards in New Zealand. In addition to her work at GNS, Julia spent 2 years in the UK from 2002-2004 working on environmental impact assessment, energy issues and urban development.

Dr David Johnston, Joint Centre for Disaster Research, Massey University/GNS Science

David has been employed with GNS since 1993 and his research is focused on reducing the vulnerability of New Zealand's society, economy and infrastructure to hazards. He has been involved in developing integrated risk management strategies for different hazard events, using techniques such as scenario development, mitigation planning and community education programmes. He is also interested in assessing social and economic impacts of natural and environmental hazard events.

Professor Douglas Paton, University of Tasmania, Australia

Douglas is a professor in the School of Psychology, University of Tasmania, and a research associate with GNS Science, New Zealand. His research and consulting work focuses on developing and testing models of community resilience for natural hazards and emergency response systems (with a particular focus on information management, decision making and integrated/team emergency management).

Douglas is managing several projects concerned with developing effective national community risk communication and warning systems for bushfire hazards. He is also currently consulting to Auckland District Health Board on the development of crisis team information and decision management for health (e.g., pandemic) crises. Douglas is working with the Bureau of Meteorology, CSIRO Sustainable Ecosystems, GeoScience Australia, and Emergency Management Australia on hazard resilience and vulnerability research policy. This work will inform the development of effective risk communication and resilience development strategies.