



# Measuring Community Resilience

3<sup>rd</sup> Societal Planning for Natural Hazards  
Research Forum  
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## Presentation Overview

- Project background
- Resilience model
- Pilot surveys
- Results
- Application



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The Auckland Region Civil Defence Emergency Management Group (CDEM Group) has a vision of  
*A Resilient Auckland Region.*

## *Resilient Auckland* Project Objectives

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- **Develop a model of community resilience**
  - How can we better understand resilience?
  - What attributes does a resilient community have?
- **Use the model to assist in developing emergency management programmes**
  - What can the CDEM Group do to better influence community resilience?
- **Use the model as an indicator of resilience over time**
  - How resilient is Auckland currently?
  - Can we measure the impact the CDEM Group is having?

# Resilient Auckland Project Timeframe

Plan Target 1.1

2005/2006

- Develop a generic model for resilience
- Test the model in the context of a volcanic scenario in Auckland
  - pilot survey
- Use the model to 'score' Auckland's current level of resilience

2006

- Verification of the model in the context of a pandemic scenario
  - second survey (August 2006)

2007/08

- Apply the model to develop practical tools the CDEM Group can use to improve outcomes
- Expand the model to include other aspects of resilience

Plan Targets  
1.2 & 1.3

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## Resilience

### Adaptive Capacity

Society's capability to:

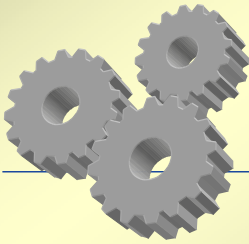
- draw upon its individual, collective & institutional resources & competencies
- to cope with, adapt to, & develop from the demands, challenges and changes encountered during & after disaster.



## Resilience

Comprises several interdependent levels

- built environment
- attitudinal/behavioural
- community & cultural



## Resilience to what?

Klein et al. (2003)

### Issues

- infrequent hazards
- readiness work undertaken during quiescent periods
- generalise across communities & hazards

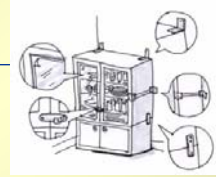
### Solution

- identify general characteristics of response during phases of disaster

# Resilience during a disaster

## Immediate impact

- protective measures adopted
  - structural integrity of home
  - securing fixtures/fittings
- reduce risk of injury and death



## Impact phase (3+ days)

- readiness
  - emergency plans & resources
  - capacity for self-reliance
- capacity to confront/adapt to hazard consequences <sup>9</sup>



## Response/recovery/rebuilding phase

- work with neighbours & community members to confront local demands
  - plan & execute tasks collectively
- progressive increase in interaction between community members & societal-level institutions
  - empowerment/trust



## Resilience comprises:

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- **Competencies** to use **available resources** and to confront problems/ **adapt** to hazard consequences
- Mechanisms to **integrate** the different levels of resilience to ensure a coherent societal capacity
- Mechanisms to ensure **sustained availability** of resources/ competencies
  - over time
  - in periods of hazard quiescence, and
  - with changing community membership/needs

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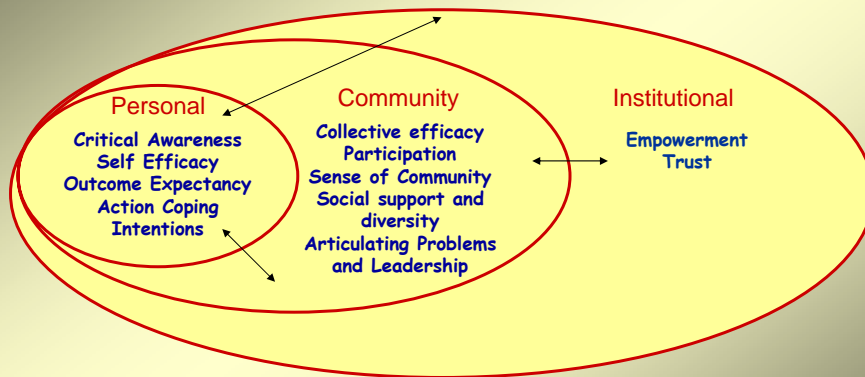
## The Model

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- Identifies factors at the individual, community and societal levels that have been implicated in promoting a capacity to adapt to adverse circumstances
- Uses generic factors
  - All hazards/ different communities/ different scales
- Represents the first time that the collective role of the factors has been systematically examined
- Approximates resilience, as it only focuses on factors that have the potential to be changed
  - personality factors and family dynamics excluded

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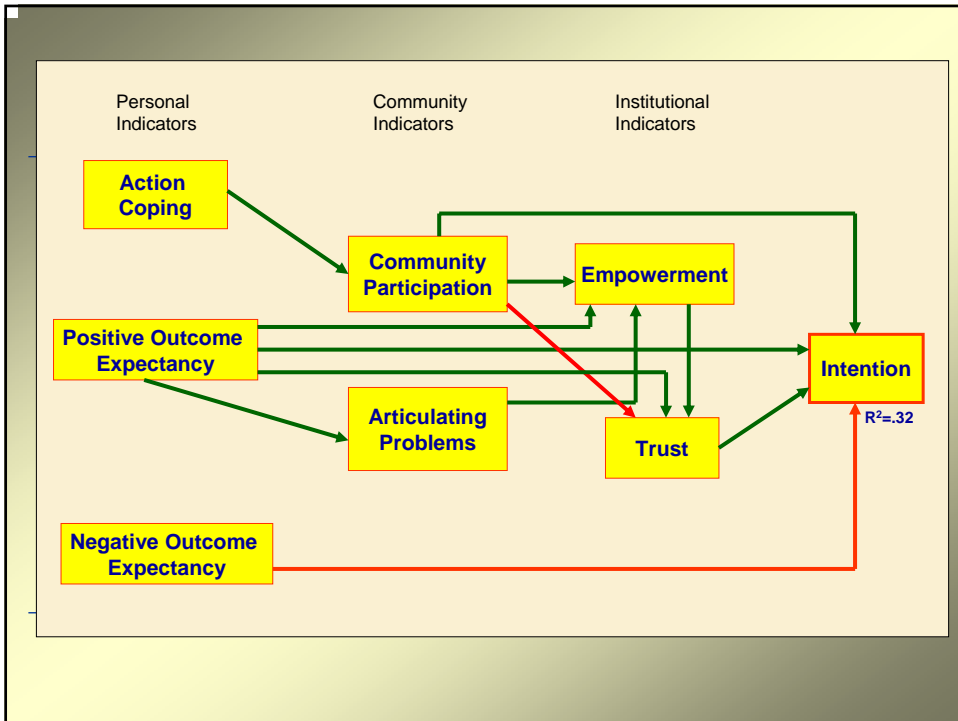
Community Resilience Model

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## The surveys

1. 2005 pilot telephone survey (sample size = 300)
  - Volcanic scenario
2. 2006 telephone survey (sample size = 400)
  - Pandemic scenario

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## Resilience Score

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- Basic resilience indicator developed from mean scores for each of the model variables
- 1(low) to 10 (high)

### Auckland = 5.5

- Auckland first to do this so no comparison (i.e. is this average or not?). However this score is in the range expected of a community with no first hand hazard experiences to call on

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Volcanic Survey, 2005

## Summary of Variables

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Intention	M
Action Coping	L
Negative Outcome Expectancy	M
Positive Outcome Expectancy	L
Community Participation	M
Articulating Problems	L
Empowerment	M
Trust	M
Preparation	L

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Pandemic Survey, 2006



What does this mean for developing Auckland's resilience to hazards?

## Intervention must address factors at three levels:

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**Personal level** – develop people's problem-solving skills (*action coping*), their belief in the benefits of hazard mitigation (*outcome expectancy*) and their ability to confront hazards (*reduce negative outcome expectancy*).

**Community level** – encourage active involvement (*community participation*) in community affairs and develop community ability to resolve collective issues (*articulating problems*).

**Institutional level** – develop an individual's ability to influence what happens in their community (*empowerment*) and the level of trust they have in councils (*trust*).

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# Traditional approaches

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- Public hazard education based solely on the dissemination of information is ineffective. Communities must be actively engaged by civic agencies.
- Resilience is enhanced when civic agencies empower community members rather than imposing their views upon them.

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The model will conservatively allow us to predict a 10% increase in the resilience of the community.

For every 25-30% increase in the model variables, resilience should increase by 10%.

Expressed in terms of recovery, this represents a decrease of a day for every 10 days otherwise taken to recover from an event.

Focussing on targeted interventions across all the model variables represents a very good cost benefit ratio.

# Further Work

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- Assessing organisational resilience and integrating this into the current model
- Converting the learning from the resilience surveys into actions to increase resilience.
  - Development of risk communication strategies
  - Converting ideas into practical intervention strategies

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