THE AUSTRALIAN NATURAL DISASTER RESILIENCE INDEX

DEVELOPING AN INDEX OF RESILIENCE FOR AUSTRALIAN COMMUNITIES TO NATURAL HAZARDS

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HYOGO FRAMEWORK FOR ACTION

The HFA is a 10-year plan (2005-2015) to make the world safer from natural hazards.

It was endorsed by the UN General Assembly following the 2005 World Disaster Reduction Conference.

HFA recognises the need to develop key indicators of vulnerability as a key activity.

Develop systems of indicators of disaster risk and vulnerability at national and sub-national scales that will enable decision-makers to assess the impact of disasters on social, economic and environmental conditions and disseminate the results to decision makers, the public and populations at risk.
WHY RESILIENCE?

Although the HFA looks for indicators of vulnerability it also discusses resilience, defining it as;
The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure.

Vulnerability vs Resilience

Both have numerous definitions
At their simplest they are seen as opposites, however

Vulnerability is increasing being seen as a function of risk and hazard specific
Resilience is more often seen as broader in scope, takes an all-hazards approach and incorporates recovery or ‘bouncing back’
INTEGRATION WITH PPRR

PPRR – (Comprehensive Approach)
Prevention
Preparedness
Response
Recovery

Risk Assessment
- Identification
- Analysis
- Evaluation
- Treatment

Resilience
- Coping capacity
- Adaptive capacity

Vulnerability
- Exposure
- Sensitivity

?
AUSTRALIAN NATIONAL STRATEGY FOR DISASTER RESILIENCE

The NSDR recognizes four characteristics of disaster resilient communities:

1) they function well while under stress
2) they adapt successfully
3) they are self-reliant and
4) they have strong social capacity.
Some form of measure and benchmarking is needed.

While there are a number of indexes throughout the world (Cutter, Embrace, etc). These have not been applied to Australia, for Australian communities or based on Australian policy.

Project Aim:
This project will develop an index that measures the current state of disaster resilience for the Australian population – the Australian Natural Disaster Resilience Index.
PROJECT OBJECTIVES

1. Develop and test an Australian Natural Disaster Resilience Index
2. Report on the current state of disaster resilience in Australia using the Australian Natural Disaster Resilience Index
3. Develop guidelines for applying the Australian Natural Disaster Resilience Index in a local planning context
4. Contribute to national, state and local policy development through multiple BNHCRC priorities
PROJECT OUTCOMES

1. Provide measures of disaster resilience that are aligned with Australia’s National Disaster Resilience Strategy
2. Provide a tested quantitative assessment of the current state of disaster resilience within Australia at the national and local scales
3. Provide examples of the use of the index for resilience planning
4. Provide a system for monitoring, evaluating and reporting disaster resilience in Australia
PROJECT TIMELINE

**Conceptual basis**
- 2014-2015
  - Conceptual framework
  - Indicators

**Data collection**
- 2014-2017
  - Indicators split into themes for collection and testing

**Reporting**
- 2017-2018
  - State of disaster resilience report
  - Data products (GIS layers)

**Case Studies**
- Framework
- Local Planning
- Scenarios and case studies
THE NEED FOR A CONCEPTUAL FRAMEWORK

So many definitions of resilience:
Alexander Stein (2013) from the IFPRI has a 30 page working paper just discussing the definitions of resilience.

• an ability to recover from or adjust easily to misfortune or change
• Resilience: (i) ability to recover readily from illness, depression, adversity, or the like; buoyancy, (ii) the ability of an ecosystem to return to its original state after being disturbed
• Resilience: The positive ability of a system... to adapt itself to the consequences of a catastrophic failure
• Add so on ...

We needed to clarify the terminology and scope in respect to the project.
DEVELOPING A CONCEPTUAL MODEL

Resilience of a social-ecological system is related to the capacities of a system that allow it to:

- withstand,
- absorb &
- recover from disturbance

&

- adapt in anticipation of, or in reaction to a disturbance (e.g. hazard event)

We are also taking an all hazards approach i.e. resilience of any place to any event
CONCEPTUAL MODEL - PLACE

The characteristics of this place can be described*...

- People/ Demography
- Environment
- Economy
- Public Administration
- Social Setting
- Infrastructure
CONCEPTUAL MODEL

Place

Characteristics

Coping Capacity - the factors that allow the community to anticipate, cope with, absorb and attain satisfactory community functionality in a natural hazard event.

Adaptive Capacity – The factors that create and enable the capacities of the community to adapt in anticipation of, or in reaction to a disturbance

Identifying & measuring capacity-enabling characteristics into a resilience index is our focus

External Factors & Linkages
So the resilience of a community is function of the

Coping Capacity and the

Adaptive Capacity

And a form of measure can be determined from the characteristics of that place
WHAT WILL THE AUSTRALIAN NATURAL DISASTER RESILIENCE INDEX LOOK LIKE?

• Composed of and reported at multiple informational levels using a hierarchical approach i.e.

Diagram:
- Resilience to natural hazards
  - Adaptive capacity
    - Indicator theme
      - Indicators
  - Coping capacity
    - Indicator theme
      - Indicators
# COPING CAPACITIES

<table>
<thead>
<tr>
<th>Theme</th>
<th>Indicators</th>
</tr>
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<tbody>
<tr>
<td>Emergency services</td>
<td>i.e. volunteerism, active units, funding, access to medical services,</td>
</tr>
<tr>
<td>Self-reliance</td>
<td>Planning, training, insurance, education levels, wealth, family structure, language competency and ethnicity, housing capital/home ownership, migration, transport, vulnerable/special needs groups, communication access, remoteness, early warning systems, reliance on aid/social services</td>
</tr>
<tr>
<td>Mitigation</td>
<td>Built environment, building standards, critical infrastructure protection, mitigation schemes, rural/urban setting</td>
</tr>
<tr>
<td>Economic capital</td>
<td>Employment, business wealth, income equality, single sector employment dependence, population growth or loss</td>
</tr>
<tr>
<td>Risk awareness and access to information</td>
<td>Locational awareness, access to information, t of information, communication methods, past disaster declarations</td>
</tr>
<tr>
<td>Social cohesion &amp; connectedness</td>
<td>Place attachment, political engagement, volunteerism, advocacy, wellbeing, health, civic organizations, community bonds</td>
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<tr>
<td>Recovery potential</td>
<td>Schools, hospitals, tradespeople, municipal services, insurance, social characteristics</td>
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<tr>
<td>Natural capital</td>
<td>State of the environment</td>
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## Adaptive Capacities

<table>
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<tr>
<th>Theme</th>
<th>Might include things about (needs to be supported by literature)</th>
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<tbody>
<tr>
<td>Governance</td>
<td>Learning organizations, innovation, policy mechanisms, political will, shared responsibility, legal and regulatory constraints to change</td>
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<tr>
<td>Risk reduction</td>
<td>Mitigation funding, policy mechanisms, building code change, royal commissions/inquiries/court case recommendations, availability of information, risk perception and training</td>
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<tr>
<td>Social cohesion /connectedness</td>
<td>Neighbourhood attachment, self-reliance, adaptive strategies</td>
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<tr>
<td>Community engagement</td>
<td>Programs, funding, effectiveness, innovation, education, community led action, participation, relationship building, risk perception and training, effective messaging</td>
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<td>Partnerships</td>
<td>Public-private, government, funding, insurers</td>
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<tr>
<td>Learning and review</td>
<td>Single-double-triple loop learning, reviews, litigation, legal obligation, research and development</td>
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<tr>
<td>Leadership</td>
<td>Political leadership, policy leadership, organizational leadership,</td>
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WHAT WILL THE AUSTRALIAN NATURAL DISASTER RESILIENCE INDEX LOOK LIKE?

Indicators of Resilience mapped across Australia at the most appropriate scale

MCAS – ability to add risk and other information

Themes

Indicators

Capacities
WHAT IS THE MOST APPROPRIATE SCALE?

Potential uses – strategic planning, supporting adaptation, policy development, community engagement

Approx 500 LGAs
2000 SA2 areas
and 55000 SA1

However data needs to be available Australia wide, and of fine enough scale to be useful, ABS SA1 data has an added error.
AT THIS STAGE WE STILL HAVE MORE QUESTIONS THAN ANSWERS

How do we measure various aspects of resilience, what indicators can be used, at what scale, is the data available etc ...

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THANKYOU

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