

OPTIMISING MITIGATION MEASURES POLICY AND PLANNING DECISION SUPPORT



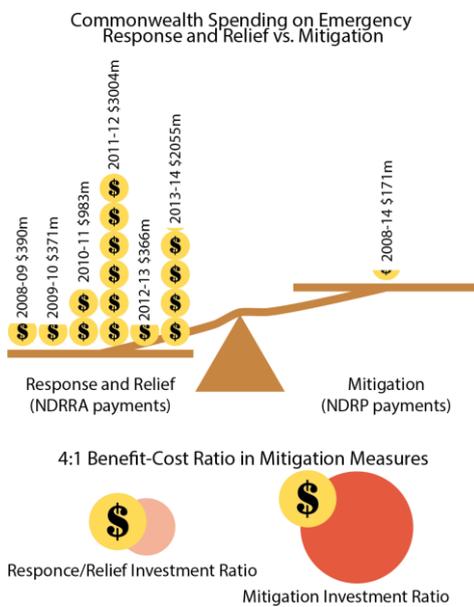
Jeffrey P. Newman¹, Holger R. Maier¹, Hedwig van Delden^{1,2}, Aaron Zecchin¹, Graeme C. Dandy¹

¹ School of Civil, Environmental and Mining Engineering, University of Adelaide, South Australia ² Research Institute for Knowledge Systems, Maastricht, The Netherlands.

WE ARE DEVELOPING A DECISION SUPPORT SYSTEM FOR THE ASSESSMENT OF POLICY AND PLANNING INVESTMENT OPTIONS FOR OPTIMAL NATURAL HAZARD MITIGATION

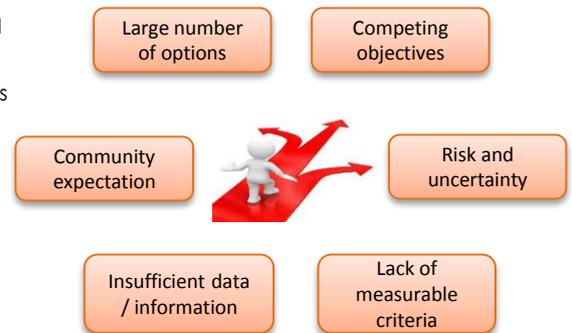
1. SOCIAL AND ECONOMIC LOSSES FROM NATURAL DISASTERS ARE TOO FREQUENTLY EXCESSIVE

The Commonwealth government spent \$7.2 billion over the last six years on recovery and relief. However, mitigation activities before a disaster occurs can be very effective in reducing losses. It is generally accepted that \$1 invested in mitigation can save, on average, around \$4 in recovery costs.



2. DEVELOPING AND IMPLEMENTING LONG TERM MITIGATION SCHEMES CAN BE DIFFICULT

- ▶ Decision makers tend to invest in works with clearer short-term benefits.
- ▶ Risk attributed to disasters is prone to inaccuracy as disasters are relatively infrequent.
- ▶ The people influencing mitigation activities may have little personal experiences to guide their evaluation.
- ▶ Mitigation budgets are always limited.

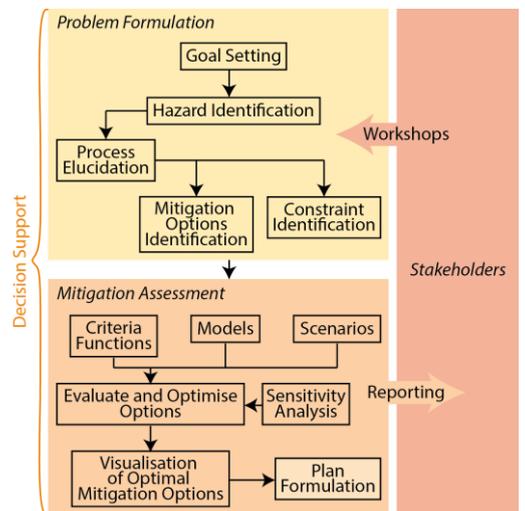


3. DECISION SUPPORT SYSTEMS (DSS) ENHANCE ANALYSIS CAPABILITIES

- ▶ DSSs are transparent and can quantify the expected benefits of mitigation investiture across multiple criteria, and
- ▶ DSSs can assess the likelihood and consequences of natural disasters across multiple criteria.

Our DSS will:

- ▶ Combine simulation and optimisation techniques.
- ▶ Use optimisation to sift through and select mitigation options that result in optimal trade-offs between criteria.
- ▶ Use a workshop driven development approach to ensure the system is fit for purpose and to foster system adoption.



4. ADVANTAGES OF OUR APPROACH

- ▶ Incorporates a spatially-explicit and dynamic land use model.
- ▶ Delivers three prototype case study DSSs, the first one being Greater Adelaide.
- ▶ Includes a user-friendly interface targeted towards mitigation impact assessment.
- ▶ Uses what we know today, and uses advanced computational techniques to make the most of this.
- ▶ Uses an integrated approach: (1) Assessment criteria are evaluated across the emergency management cycle. (2) Mitigation options are evaluated for their impact across multiple hazards and multiple scenarios. (3) A multicriteria approach is used so that other community objectives are considered.
- ▶ Explicitly considers climate change.
- ▶ Deals with uncertainty in a risk-based approach.

