

# Planning, building and insuring: Adaptation of built environment to climate change induced increased intensity of natural hazards

King, D, Ginger, J, Williams, S, Cottrell, A, Gurtner, Y, Leitch, C, Henderson, D, Jayasinghe, N, Kim, P, Booth, K, Ewin, C, Innes, K, Jacobs, K, Jago-Bassingthwaighte, M, Jackson, L





Centre for Disaster Studies & Cyclone Testing Station, James Cook University, Housing & Community Research unit, University of Tasmania



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# Method

## Case Study Approaches and Scales

Case Study Approach	Tropical	Sub-Tropical	Temperate
<b>Wind Event</b> Cyclone High Wind Events /Storms	Case Study - CTS Codes Standards Regulations Specifications Damage implications Building stock Losses	Extend hazard implication across all regions 	
<b>Water Event</b> Storm Surge Inundation Flood		Case Study - CDS Land use planning Risk zoning Development planning Design Infrastructure Perceptions/views	
<b>Fire Event</b> Bushfire Fire Storm Extreme Fire Weather	Extend hazard implication across all regions 		Case Study - UTAS Insurance Policy Drivers/barriers Land use planning Building stock

# Planning

Queensland Floods Commission of Inquiry recommendations about land use planning are sound and sensible contributions to changes that are necessary to enhance capacity of planners and councils to mitigate natural hazard impacts, adapt to extreme weather events and to impacts that may result from climate change

hazard zones - flood, bushfire, storm surge, flash flood, landslide - must be mapped in sufficient detail to inform planning development assessments and decisions

comprehensive flood studies - ideally in whole catchments

primary planning legislation should directly identify hazard mitigation planning under the act

lack of agreement or consensus amongst planners in response to FCI recommendations concerning:

- Land swaps and buybacks of properties in highly hazard vulnerable locations;
- Retreat or relocation strategies;
- The use and usefulness of defined flood levels such as the Q100;
- Regulation and construction of hazard protection measures such as levees;
- The level of government responsibility and funding for hazard mitigation and related activities



## Four groups of significant issues found consensus amongst planners:

- Whole of catchment flood mapping,
- Climate change adaptation as part of hazard mitigation,
- Zones of limited or constrained development, and
- Flash flooding



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## consensual recommendations, derived from the Flood Inquiry recommendations -

- Local government councils should be responsible for the development of a **floodplain management plan**
- Floodplain management plans should adhere to **best practice** guidelines.
- **Comprehensive flood studies** should be carried out in all local government areas in Queensland.
- Comprehensive flood studies must take into account the likely impacts of **climate change** on future floods.
- Comprehensive flood studies should be carried out within the context of the **whole catchment**.
- **Planning schemes should be amended** immediately as better flood information becomes available, or if development results in a change to flood risk hazard zones.
- All areas of **future urban growth** should be mapped for three or more levels of flood risk.
- All local government area flood mapping should be **accessible** to members of the public on a web site or as printed maps

## Consensus continued -

- The **flood risk to all individual properties and parcels of lands** should be made available to the public.
- Queensland Planning Provisions should define a **zone of limited development**, or constrained land, areas subject to high risk of flooding, in order to impose severe restrictions on urban development in high risk areas.
- Detailed flood advice affects property values, but if property values are affected by detailed flood advice, **councils should not be responsible for compensating** property owners for any loss of value.
- **Councils are not liable** for flood impact damage as long as the council has carried out reasonable mitigation



Image © Survey Respondent 4

## Consensus continued -

- **State Development areas** must take account of flood risk and should be constrained in the same manner as any other development
- **Construction works & fill** in low lying flood prone areas not permitted if increase local flooding or reduce flood storage capacity.
- **Community infrastructure** must be able to function effectively immediately after a flood or any other kind of natural disaster.
- Planning schemes should contain **flood and stormwater policy** that sets out information to be provided in development assessments.
- Because **overland flow paths** are primarily conduits for flash floods these must be mapped as part of overall flood risk assessment



Image © Lockyer Valley Regional Council





# Building

- The resilience of houses to natural hazards such as windstorms, floods and bushfires can be improved by revising **regulations (BCA) and design standards**. Revisions to design and construction standards have resulted in post-80s houses being more resilient to windstorms compared to pre-80s houses
- **Structural upgrading** is effective in reducing the vulnerability of pre-80s houses throughout Australia.



Image © Jayasinghe



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# Building -

- The provision of **of building envelope protection** against windborne debris will also reduce the vulnerability of post-80s houses, especially in non-cyclonic regions. This is an adaptation strategy that would also be effective for **shift in cyclone boundaries** or increases in wind loads that result from climate change
- **Education to improve the house building-process** (regulation, design, construction, certification and maintenance) and for all parties (designer, builder, certifier, and owner) will also enhance community resilience



Image © Cyclone Testing Station

# Insuring

- That further research be conducted into the contexts and processes informing **people's prioritisation** in the purchase and maintenance of insurance policies, including their awareness of, and interest in what these policies do and do not cover.
- Public expectations of insurance more closely aligned with the insurance reality through **clearer insurance industry communications** with customers and through government-driven education initiatives.
- That research to ascertain the **likely changes in the costs and availabilities** of insurance coverage and subsequent impacts on the built environment be undertaken **in light of climate change** with direct reference to natural hazards.
- Mechanisms for providing **affordable insurance to low-income earners must** be further investigated and implemented.
- That insurance be recognised, explored and implemented as a mechanism for **promoting disaster-preparedness & recovery** with regard to climate change adaptation
- That insurance be recognised and implemented as acting in concert with other mechanisms such as **building codes and land use planning** regulation

- Further research into public **prioritisations regarding climate change adaptation** and risk mitigation
- Government in collaboration with insurers investigate and implement appropriate climate change adaptation mechanisms such as the development of **long-term insurance contracts**.
- Research to identify, develop and implement instances of **innovation regarding the role of insurance in climate change adaptation** and risk mitigation.
- Research to assess how insurance best operates as a **climate change adaptation mechanism** across individual, household, business & community levels.
- Government interventions into the insurance industry and insurance markets reconcile existing **tensions between government and individual responsibility** for risk.

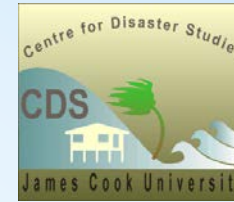
- That a review be undertaken into the factors that impact on **insurer activity in encouraging and incentivising climate change adaptation** and associated risk mitigation measures.
- That **non-regulatory and regulatory approaches** to the use of insurance in climate change adaptation and risk mitigation be investigated and implemented.
- That more **effective linkages** be fostered between the various, relevant agencies and organisations across public and private sectors, including those in the insurance and reinsurance industries.
- That state and federal governments demonstrate greater leadership on the investigation and implementation of the **role of insurance in climate change adaptation**.
- That comprehensive **hazard data sets and risk maps** be made available to all stakeholders and compliance implemented

**Insurance assistance to build back better**

A vulnerable  
business and  
essential service  
for recovery

Social capital -  
Building the great  
wall of Charleville

QUESTIONS



# IMPACT OF THE 2010/11 FLOODS AND THE FACTORS THAT INHIBIT AND ENABLE HOUSEHOLD ADAPTATION STRATEGIES

Deanne Bird<sup>1</sup>, David King<sup>2</sup>, Katharine Haynes<sup>1</sup>, Pamela Box<sup>1</sup>,  
Tetsuya Okada<sup>1</sup>, Kate Nairn<sup>2</sup>

<sup>1</sup> Risk Frontiers, Macquarie University

<sup>2</sup> Centre for Disaster Studies, James Cook University



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The **main objective** of this research was to identify the factors that inhibit and enable adaptation strategies within flood affected communities. To achieve this, a mixed methods survey was carried out in three case study locations: Brisbane Chelmer, Graceville, Tennyson, and Rocklea and Emerald, Queensland, and Donald, Victoria

- 1) households in flood affected areas and
- 2) local and state government institutions and authorities that provide services to the community.

Qualitative and quantitative data were collected via face-to-face interviews and questionnaires distributed door-to-door and online





The main factors that were identified as either enabling or inhibiting response, recovery and / or adaptation are:

**Direct experience** - many people stated that the history of flood events, the inconvenience and stress associated with being flooded and the pain and heartache that the floods caused were significant factors driving their desire to reduce their vulnerability.

**Outcome expectancy** - some respondents revealed desired outcomes such as the need to protect family members, belongings and assets and, a desire to have peace of mind, were positive drivers in changing their behaviour to reduce flood risk.

In contrast, others could not comprehend how changes will prevent a disaster occurring from a natural event.



Image © Risk Frontiers

**Communication and information** - the most widespread series of responses called for more communication and more information prior to and during the flood - that residents are more willing to adopt reactive strategies rather than proactive measures. people in Brisbane and Donald felt the warnings were inadequate & were not sure what to do when they received flood warnings.

**Governance and physical protection** - respondents perceive that more dams, better control and management of dams and the construction of levees to reduce their flood risk. Other governance issues related to planning and development, building regulations and information.

**Insurance** - in all communities respondents cited the slowness of obtaining insurance payouts as a barrier to recovery. There is a great deal of anger directed towards the attitudes of insurance companies, the quality of the assessment process, and a lack of clarity in relation to what was covered. Many people referred to 'being held hostage' by insurance companies with little idea of their personal rights. Moreover, there was little or no immediate support coming from the insurance industry to assist people to make changes to reduce their risk

- The build back  
Better theme



**Financial restraint and relief assistance** - those people who were not covered by insurance are very limited in their capacity to make changes to their homes due to a lack of funds. Compounding the insurance issue was the fact that many people were not eligible to receive financial assistance from sources such as the Premiers Flood Appeal.

**Housing** - including design / construction, rental properties, builders and guidance - residents felt they had no options to make changes to reduce their future risk due to the structural design of their home and / or the fact that they resided in a rental property. Respondents cited 'slab-on-ground' constructions as the main reason for not being able to make changes because raising their home was simply not an option.

**Health and wellbeing** - health impacts, both physical and mental, were identified, leading to problems in recovery. Interestingly, those respondents from Brisbane and Emerald who were mid-high household income earners (\$100,000-\$150,000) indicated more negative impacts in terms of wellbeing compared to those in the low and low-mid income brackets.



**Relocation** - while some respondents in Brisbane and Emerald suggested that they would consider relocating to a safe location, the dominant response is that people do not consider that it is likely they will move, especially in Donald. This is as one would expect, or hypothesise. It reflects resilience and community strengths.

**Volunteers and community initiatives** - positive and negative aspects of volunteerism were cited. It was recognised that people felt a need to volunteer, in order to do something, but there were problems of a lack of control and some inappropriate assistance. A strong impression from the case study responses was the willingness of residents to get on with their own recovery and to make improvements to reduce the flood risk in the future. This was particularly evident in Donald where local residents established the Donald Community Flood Recovery Group.

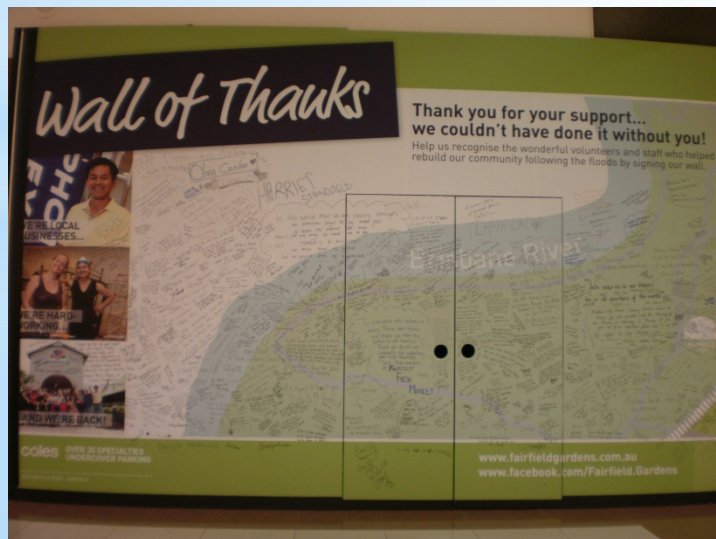
Brisbane's  
mud army

**Dominant finding** from the study - a greater number of constraints inhibit adaptation than factors that enable adaptive change & behaviour. Balanced against the criticisms and fault identification the study showed resilient communities getting on with their lives and largely driving recovery themselves.

The extensive qualitative comments and opinions garnered from interviews and questionnaires reflect high levels of acceptance of catastrophe and stoic endurance.

This does not necessarily translate to adaptation to future events and a changed hazard landscape, but it does reflect strong resilience in the community.

That resilience can be built on to advance adaptive behaviour, but it needs to be nurtured and facilitated by external agencies



Wall of Thanks - Fairfield Shopping Centre

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