

# Community adaptation strategies to floods

## Investigating affected communities in the aftermath of the 2010–11 floods

Understanding how floods impact communities provides insights on policies aimed at reducing the impact of future flood events. Climate change scenarios suggest an increase in extreme rainfall events, contributing to a greater frequency of riverine and flash floods. At the same time, Emergency Management Australia has shifted its policies for hazard mitigation towards building resilient communities. The experiences of psychological, financial and social stress within the communities preparing for, dealing with, and recovering from the floods provides information to planners and emergency managers. This project looked at the factors inhibiting and enabling household adaptation strategies in the flood-affected communities of Brisbane, Emerald and Donald in the aftermath of the 2010–11 flooding events. Researchers uncovered strengths and weaknesses in community resilience through surveys and face-to-face interviews with residents and local and State government agencies.

### Main factors affecting response, recovery and adaptation to floods

- » Memory of hardship from direct flood experience
- » Expectation of success from adaptation strategy
- » Lack of support from insurance companies
- » Negative physical and mental health impacts
- » Inadequate communication before and during flooding events
- » Structural limits to adaptive housing redesign
- » Financial constraints limiting capacity for change
- » Relocation resistance due to community identity
- » Participation in community initiatives
- » Perceived government protection through dam management, building regulations, and planning

### The Brisbane, Emerald and Donald case studies

Study participants reported ample evidence of community resilience through 39 face-to-face interviews and 210 survey responses. The interviews were conducted during scoping trips to Brisbane and Emerald in January 2011 and at all case study locations during fieldwork in August and September 2011. The surveys were completed in person during fieldwork and online by residents who had provided their email address to the research team.

#### » EFFECTS OF THE FLOOD

In the Brisbane catchment, heavy rainfall following the passage of Tropical Cyclone Tasha caused major flooding of Brisbane city in early January 2011. Water released from the Wivenhoe Dam exacerbated the situation, raising the Brisbane River to a peak flood level of 4.5m. This flood inundated 35 suburbs and more than 14,000 properties.

In the Fitzroy catchment, heavy rain in late 2010 caused a similar build-up in the Fairbairn Dam, swollen rivers and minor flooding that fed the successive floods of Emerald in early December 2010. Then, from December 30, 2010 to January 2, 2011 water levels rose to a peak of 16m. This second larger flood inundated 3,000 properties, flooded 1,000 houses and caused the evacuation of 1,200 people.

High rainfall in the Avoca/Avon-Richardson catchment during the summer of 2010–11 ended a 14-year drought period and caused three successive floods in Buloke Shire, which contains Donald and neighbouring communities such as Charlton. The water levels recorded in the

Richardson River were the highest since 1909. The flood caused extensive damage to agricultural land and public infrastructure and inundated 15 properties.

#### » COMMUNITY IMPACTS

Residents from all three locations reported that the experience of previous flood events, the inconvenience and stress associated with being flooded, the need to protect children, belongings and assets, and the desire to have peace of mind were the driving factors promoting changes that would reduce their vulnerability to future flooding events.

Despite taking protective actions before and during the flood (see table below), the majority of residents also

	Brisbane	Donald	Emerald
Devised an evacuation plan	23	13	26
Prepared an evacuation kit	13	2	25
Followed warning advice from media	42	17	57
Sandbagged house	13	32	40
Built temporary flood barriers around property	0	11	12
Kept drainage clear of debris	8	15	20
Raised household items up off floor	65	17	64
Moved household items to safety	61	9	40

Percent of respondents that took protective actions before/during flood

reported that they did not intend to make changes within the next decade. Financial costs, design and construction of homes, insurance limitations, government restrictions on building levees for private properties, and renting were the most commonly reported impediments. A minority believed that it was impossible or too difficult to prevent the course of nature. Overall, very few people reported they would move to a flood safe location.

Respondents showed markedly contrasting views on the assistance provided by State Emergency Services and volunteers. In Brisbane and Donald, volunteer help was welcome but residents complained about lack of organisation and the absence of council workers or SES volunteers. In Emerald, however, residents praised the actions of volunteers and council workers.

The survey also examined the emotional and social impacts of the flood. Most residents from Brisbane reported no change in their relationships with friends and family, but a negative impact on their happiness and financial

status. More than two-thirds of Donald and Emerald residents reported no change to their wellbeing. Yet, the loss of sentimental items and their connection to memories were universally deeply felt.

Insurance coverage was an important issue for respondents. Almost three-quarters of residents in Brisbane knew that their house was vulnerable to flood but only 25% had insurance for all flood types. Possibly due to recent experience, 42% of Emerald residents had insurance for all types of flood, while only 4% of Donald residents were fully covered. Consequently, the modification of insurance cover was reported among the highest ranked changes that had already been, or was likely to be done.

While all three communities faced challenges when rebuilding, Emerald residents reported more significant inhibiting factors including house structure type (for example, slab-on-ground construction), limited availability of builders, lack of guidance for reconstruction, and existing housing shortages.

## Recommendations to enable successful community adaptation strategies

**Target all demographics with specific, action-oriented communication** before, during and after the flood events. People need information that is highly specific to their own localities to guide decision-making and to inform them of appropriate and safe behaviour during the period of flooding, during the immediate aftermath of flooding and during the recovery.

**Legislate against constructing vulnerable housing styles in flood prone areas** and provide guidance for resilient floodplain designs, like the 'Queenslander' style home that is designed to let flood water flow underneath.

**Educate property owners on flood resiliency of housing construction.** The desire to rebuild "better" can be redirected to rebuild "resilient" with the benefit of increased status and higher property prices.

**Promote and maintain volunteerism and community initiatives** facilitating response, evacuation, recovery and support for residents affected by floods. These networks help support vulnerable residents, who are unwilling or unable to relocate, to cope with floods.

**Document personal flooding narratives as educational tools** to maintain collective memory. The inconvenience and stress associated with being flooded are significant factors driving the desire to reduce vulnerability.

**Increase the quantity, quality, and management of protective structures** like dams, drainage systems, and barriers.

**Advocate for insurance company cooperation** to expedite approval and payout of claims while rewarding households that reduce future flood vulnerability.

**Re-evaluate the scope of government relief programs** to find compromise between community expectation and government financial capacity in a future where large-scale hazardous events may occur more frequently.

**Inform communities about the limited, voluntary nature of the State Emergency Service (SES)** to reduce unreasonable expectations from residents and encourage increased participation and donation to the SES in the future.

This document summarises key findings from the NCCARF report *Impact of the 2010/11 floods and the factors that inhibit and enable household adaptation strategies*. The project was funded by NCCARF and led by Deanne Bird, Macquarie University. To download the full report go to: [www.nccarf.edu.au/content/investigating-adaptation-strategies-floods](http://www.nccarf.edu.au/content/investigating-adaptation-strategies-floods)

This work was supported financially by the Australian Government and the partners in the NCCARF consortium. The views expressed are not necessarily those of the Commonwealth and the Commonwealth does not accept responsibility for information or advice contained within.