Key flooding lessons from Australia and abroad

Compiling findings from formal flooding reviews

This project aimed to synthesise findings of Australian and overseas flood inquiries and reviews to identify lessons for living with floods in Australia. Researchers analysed and synthesised the findings of four recent Australian flood inquiries, using a 'Prevention, Preparation, Response and Recovery' framework; and the findings of overseas flood inquiries from China, the Netherlands and the USA. Key Australian flood impact and response stakeholders were also interviewed about flood adaptation options.

Background

During 2010 and 2011 Australia experienced some of the most damaging and costly floods in recorded history. Approximately 80% of Queensland was declared a disaster zone and extensive flooding occurred in other eastern states, notably Victoria. Four major inquiries were held into these floods, the findings of which may help reduce deaths, injuries and property losses resulting from future floods. Because climate change may increase the severity, likelihood and impacts of future flooding, it is important to understand and evaluate both the process and the outcomes from these inquiries.

Australian flood inquiries

Common findings of these inquiries include:

1. support for non-structural adaptation measures, such as development planning, flood management information and emergency response management;
2. caution about levees and other engineering flood control methods; and
3. calls for better governance, policies, legislation, communication, resourcing, risk assessment, education and training.

Queensland Floods Commission of Inquiry (2012) [Queensland inquiry] addressed government and community disaster preparation and planning; insurers; flood forecasts; warnings and responses; dam planning and management; and land use. The inquiry found that dams and land use legislation can mitigate flood impacts, but dams cannot flood-proof a catchment and the dual water storage and flood mitigation roles of dams requires careful and active management. Better design and materials can improve the flood resilience of buildings, reduce damage and enable recovery. Better public access to flood risk information can reduce the impacts of floods.

Brisbane City Council's Flood Response Review (2011) [Brisbane review] assessed the effectiveness of the Brisbane City Council's disaster management capacity, management and response; flood protection initiatives; planning regulations and related matters. The findings echoed those of the *Queensland inquiry*, as applied to Brisbane and its suburbs.

Victorian Review of the 2010-11 Flood Warnings and Response (2011) [Victorian review] examined flood predictions, warnings, information; responses and recovery. Key findings include (i) the need for better construction standards for new and rebuilt structures, and (ii) that development controls are more effective than behaviour modification programs in reducing to flood damage to property.

Parliament of Victoria Inquiry into Flood Mitigation Infrastructure in Victoria (2012) [Victorian inquiry] examined flood mitigation technology and infrastructure such as levees and waterways, ecosystem management, vegetation, use of local knowledge, development controls and flood warnings. A key finding was that vegetation clearance had a negligible effect on flood depth, but vegetation growing in and around rivers had a significant benefit, reducing the effects of flooding on a catchment scale.

Insights from Australian Flood Expert interviews
Use development controls to avoid future flood risks and costs, but don't lose inexpensive housing options.
Levees are not a solution to flooding, except to protect existing urban development or individual properties.
Ecosystem measures can reduce floodwater velocity and depth, delay flooding and so increase warning time, and help protect water supplies and water quality.
Develop effective flood warnings, flood response plans and community resilience.
Disaster relief in its current form does not increase Australia's resilience to disaster, as it is over-generous and untargeted.
The insurance industry's capacity to factor climate change into policies is limited by a conflict between keeping premiums low to remain cost competitive, and ensuring premiums cover potential claims from floods and other disasters.

Overseas flood management inquiries

The project reviewed a number of overseas flood inquiries.

China

Inquiries into flood management in the Yangtze river basin linked increased flood frequency and maximum water levels to inappropriate land management such as deforestation and loss of other vegetation and wetlands. Stronger flood mitigation measures were recommended to increase the adaptive capacity of the entire basin system. These measures aim to 'give the flood a pathway' instead of 'keep the flood away', and explicitly refer to climate change adaptation.

The Netherlands

Flooding is a national security issue in the Netherlands. The Delta Committee Report (2008) was commissioned to identify future opportunities and threats from flooding in coastal regions due to climate change. Similar to Yangtze river basin flood management, the Netherlands also takes a 'give the flood a pathway' approach for flood management, allowing more land to flood by removing or setting back floodplain levees.

In the Netherlands, the costs of flood damage and reconstruction to buildings in the floodplain (outside dyked areas) are borne by residents and users who have benefited from these buildings, rather than by the community generally through government subsidies. Elsewhere, government compensation for disaster losses, including flood damage, is arranged under the Calamities and Compensation Act. Commercial insurance against flood is not available in the Netherlands.

USA

Recent flood reviews have assessed the effectiveness of levees, dams, flood mapping, the 1-in-100 year standard and the National Flood Insurance Program. A past emphasis on structural measures for flood control is giving way to approaches that support floodplain restoration and flood impact management. For those living in floodplains, relocation is widely supported as a means of avoiding future flood damages and costs. If relocation is not possible, a 1-in-500 year flood building standard has been recommended, as the 1-in-100 year flood standard does not ensure safety and concentrates development just beyond the 1-in-100 year event boundary.

Recommendations for Australian flood planning

The project developed several recommendations for future flood planning in Australia.

- Climate change needs to be explicitly included in Australian flood planning.
- Clear policies and responsibilities are required to support switching dam management from drought to flood procedures.
- Ecosystem approaches should be used to reduce flood-induced erosion and sedimentation.
- The 1-in-100 year flood risk standard should be reviewed and development planning standards should be set on the basis of catchment-scale planning.
- Community resilience should be encouraged through publicly available flood information, clear communication during emergencies and risk awareness.
- Emergency responses would benefit from greater timeliness, accuracy and reach of emergency communications.

The project also developed recommendations for flood impact recovery.

- Disaster relief should be targeted at reducing future damage through mitigation, such as voluntary land purchase, relocation or improving flood resilience of structures.
- Full cost and benefit analysis applied to flood plans and recovery programs should include all social values, including the physical and mental health of affected people and communities and of heritage and other cultural resources.
- Flood reviews should become shorter processes with a greater focus on avoiding future flood damage and costs.

This document summarises key findings from the NCCARF report *Living with floods: Key lessons from Australia and abroad*. The project was funded by NCCARF and led by Karen Hussey, The Australian National University. The full report is available at: www.nccarf.edu.au/publications/living-floods-key-lessons-australia-and-abroad

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