

Beyond a state of sandbagging: What can we learn from all the floods, in the UK and overseas?

October 27 2022, by Penny Allan, Andrew Toland and Martin Bryant



Credit: Unsplash/CC0 Public Domain

"We are [...] sandbagging the state," New South Wales Emergency Services Minister Steph Cooke [declared](#) on Saturday. And so we endure

the third La Niña season with this waiting-for-the-next-disaster attitude.

After heavy rain and repeated floods across Australia's eastern states [over the past three years](#), it's worth considering what we have and haven't learned.

A good way to improve flood readiness is to understand how floods work, and then to examine adaptive solutions developed by communities facing similar situations in other countries. Every river behaves differently and responses should be site-specific. However, the following approaches may be relevant to local conditions and are likely to improve [flood protection](#).

Work with nature, not against it

Flooding is complex. Factors such as [climate variability](#), soil saturation, loss of vegetation cover in key parts of catchments, the growth of urban areas and their hard surfaces, the failure of early-warning systems, the erosion of community self-reliance, and inadequate governance all influence the risks.

Complex unpredictable conditions call for an integrated suite of responses to manage the risk.

Engineered infrastructure, such as dams and levees, has encouraged us to live on floodplains with little regard for the impacts of climate variability. Dams and levees work within predicted parameters, but we can't expect that predictability anymore.

And planning regulations that restrict building on floodplains can be useful but are only part of the solution.

Many effective "nature-based" solutions run counter to traditional

engineering works. For example, rather than engineer a river channel to make water move more quickly through an area, nature-based solutions modify or multiply river channels to accommodate variable water volumes. These approaches spread out and slow the flow of water and encourage it to soak into the ground before reaching the river.

Overseas, China makes "[sponge cities](#)" with urban wetlands and revegetated waterways. The Netherlands has removed dykes and widened river corridors as part of its [Room for the River](#) program.

These strategies often require land to be rezoned and buildings removed. That's a brave move in the face of urban growth pressures.

But these strategies also offer an opportunity to refocus cities, towns or even regions, by reintegrating nature and opening up new spaces for recreation, environmental regeneration and biodiversity. The independent [2022 NSW Flood Inquiry](#) recognized just such an approach. Its report called for floodplains to be thought of as assets serving environmental, recreational and community uses while allowing space for flooding.

In agricultural regions, allowing farmland to flood temporarily can help relieve pressure on urban infrastructure downstream. On the US [west coast](#), for example, wetlands have been [incorporated into crop-rotation cycles](#). In times of flood these farmlands draw down excess water from the river while improving soil quality, fertility and ecosystem health. In the Tisza Valley in Hungary, [farmland has been adapted](#) as slow-release wet-season reservoirs.

Agricultural practices that improve soil quality, prevent erosion, slow runoff and encourage water to soak into the ground can also make a difference. These practices include strip cropping—alternating rows of two or more crops—to redirect and dissipate floodwaters, gully planting,

and fencing and planting riverbanks.

What can communities do?

Elsewhere, early-warning systems are drawing on citizen science to make communities less vulnerable.

In Jakarta, a low-lying city that regularly floods, Indonesian researchers capitalized on the intensity of flood-related social media posts. They developed [an app](#) to integrate and geolocate those posts across the catchment. The app gives residents access to alternative real-time data, allowing them to make their own decisions about timely preparation and evacuation.

The March 2022 floods in Lismore, NSW, show the need for such systems. The Bureau of Meteorology did not consider local rainfall measurements scientific enough to be counted as evidence and some of its [data-sensing tools were faulty](#). This type of communication failure is quite common.

Houses in flood-prone areas can be modified to cope with floodwaters. Typical measures include raising them on stilts and retrofitting interiors using materials that don't absorb water. They can then be hosed down during clean-up.

Governments can provide support to minimize vulnerability. This might include funding neighborhood resources such as boats with motors, kayaks and floodproof containers to store valuables. Water and power can be provided to designated local evacuation areas on high ground.

And then there's relocation

If all else fails, there is always managed retreat. This involves relocating a town to high ground.

[Recent research](#) reviewing all known cases of managed retreat in the United States over the past 140 years suggests this approach has had mixed results. It's enormously expensive and exhausting. Typically, the shift benefits developers and government rather than the vulnerable communities.

If communities are to move, [another study](#) suggests the move needs to be planned well in advance. It should be done outside the time frame of a flood event when affected communities are already vulnerable.

Climate Crisis: New Zealand Plans Managed Retreat In The Face Of Floods And Rising Sea Levels <https://t.co/IJI4VjMHahpic.twitter.com/yH7FFPVzVm>

— Planet Emergency (@PlanetEmergenc1) [August 25, 2022](#)

Draw on all available knowledge

In Australia, there have been increasing calls for Traditional Owners to take a leading role in exploring how our policies, planning and practices might better incorporate Indigenous practices of managing land, including catchment and river systems.

Our heavy reliance on sandbagging suggests we really don't understand the river landscapes we inhabit. Learning to live with floods, especially in the face of the uncertainties of climate change, requires us to learn from our own past as well as the successes and failures of others.

Any suite of solutions will have to be tailored to the unique conditions of a river, its landscape systems, land uses and settlement patterns. A single

solution would be nice, but that is never going to be the reality.

UTS is planning an exhibition of [flood](#) strategies in Lismore, NSW, in late November.

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Provided by The Conversation

Citation: Beyond a state of sandbagging: What can we learn from all the floods, in the UK and overseas? (2022, October 27) retrieved 27 April 2024 from <https://phys.org/news/2022-10-state-sandbagging-uk-overseas.html>

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