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Inquiry into housing policy and disaster: better coordinating actors, responses and data

From the AHURI Inquiry: Inquiry into housing policy and disasters: better coordinating actors, responses and data

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AHURI's mission is to deliver high quality research that influences policy development and practice change to improve the housing and urban environments of all Australians.

Using high quality, independent evidence and through active, managed engagement, AHURI works to inform the policies and practices of governments and the housing and urban development industries, and stimulate debate in the broader Australian community.

AHURI undertakes evidence-based policy development on a range of priority policy topics that are of interest to our audience groups, including housing and labour markets, urban growth and renewal, planning and infrastructure development, housing supply and affordability, homelessness, economic productivity, and social cohesion and wellbeing.

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Each AHURI Inquiry is supported by a panel of experts drawn from the research, policy and practice communities.

The Inquiry Panel are to provide guidance on ways to maximize the policy relevance of the research and draw together the research findings to address the key policy implications of the research. Panel members for this Inquiry:

Elly Bird	Resilient Lismore
John Brockhoff	Planning Institute of Australia
Natalia Gemmel	Emergency Relief and Support, Department of Communities WA
Susie George	NSW Reconstruction Authority
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Sharanjit Paddam	Finity Consulting
Rory Shannon	Victorian Department of Energy, Environment and Climate Action

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Acronyms and abbreviations used in this report

AGCMF	Australian Government Crisis Management Framework
AHURI	Australian Housing and Urban Research Institute Limited
AIDR	Australian Institute for Disaster Resilience
APRA	Australian Prudential Regulation Authority
ASIC	Australian Securities and Investments Commission
BAL	Bushfire Attack Level
DAP	Disaster Adaptation Plan
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications and the Arts
DRFA	Disaster Recovery Funding Arrangements
DRR	Disaster Risk Reduction
DT	Digital Twin
ERV	Emergency Recovery Victoria
LGA	Local Government Authority
NASHH	National Agreement on Social Housing and Homelessness
NCC	National Construction Code
NDRRA	National Disaster Risk Reduction Arrangements
NEMA	National Emergency Management Agency
NFIP	National Flood Insurance Program (USA)
NGO	Non-governmental organisation
NHHP	National Housing and Homelessness Plan
NSW	New South Wales
PPRR	Prevention, preparedness, response and recovery
PREP	Property Resilience and Exposure Program
SDMP	State Disaster Mitigation Plan
UN	United Nations
VBRC	Victorian Bushfires Royal Commission
VBRRA	Victorian Bushfire Reconstruction and Recovery Authority
WA	Western Australia

Glossary

A list of definitions for terms commonly used by AHURI is available on the AHURI website ahuri.edu.au/glossary.

Executive summary

Key points

Climate-related disasters are set to increase. To keep up, policies, practices and priorities must be better coordinated to meet both short- and long-term needs. This report recommends:

- **Making disasters a planning priority. Consider natural hazards and disaster risk reduction in housing strategies—including location and quality of housing.**
- **Developing a 'fourth R for resilience' (in addition to 'rates, roads and rubbish') for essential local government mandates and improving the capacity to improve the local ownership of decisions that affect communities.**
- **Putting the trust back into data. Better data-driven decision-making requires addressing limitations in data sharing through stronger data-governance regimes.**
- **Using post-disaster housing recovery funds to support local economies—for example, local accommodation options. Buyback schemes need to be transparent, fair and effective to avoid doing harm to communities.**
- **Treating temporary housing villages as a last resort. If they are used, a post-recovery repurposing plan that benefits the community must be identified at inception.**
- **Acknowledging that increasing numbers of people do not have housing disaster insurance. Better data is needed, along with more government engagement and support for mitigation and prevention measures.**
- **Simplifying complex urban planning processes, governance structures and policies to be data responsive, so that we can better assess, manage and reduce disaster risk.**

Key findings

The coordination and integration of housing policy and settlement planning with disaster prevention, preparedness, response and recovery (PPRR) is essential, as housing remediation is a vital element of disaster recovery. Furthermore, settlement planning influences where we live and, with this, our disaster risk exposure.

More effective approaches towards coordination and integration have been developed in recent years:

- *coordination:* bringing processes closer together to enhance their collaboration
- *integration:* making processes work as a whole

However, there is still significant scope for improvement.

While state emergency management and reconstruction agencies have sought to establish best practices in coordinating with other agencies, their activities and knowledge need to be more effectively integrated with those of housing and planning agencies on a day-to-day basis. Broadly, integration could be improved by:

- establishing clear policy and planning responsibilities
- clarifying political priorities
- taking a whole-of-government approach.

More attention, focus and effort is needed in this area, especially given:

- the current housing crisis in Australia
- burgeoning predicted demand for housing
- the increasing threat of rapid-onset disasters—many of which are fuelled by climate change.

Such disasters include those triggered by cyclones, bushfires, and coastal and riverine floods, which can be exacerbated by intense rainfall and storms.

Australian housing agencies are experienced in disaster PPRR, particularly in relation to emergency and temporary accommodation. Yet there is a need to better integrate disaster risk reduction into day-to-day thinking and policies by, for example:

- considering climate change impacts and disaster risk in housing strategies
- coordinating planning decisions with relevant disaster-related organisations' policies and practices.

Settlement planning agencies are experienced in disaster PPRR, particularly in risk assessment related to urban and rural development, and in supporting rebuilding efforts. Disaster risk reduction in relation to bushfires has become strongly embedded over the last decade, but risk reduction is less clearly regulated for other natural hazard threats, such as floods and cyclones.

Agency coordination could be extended in the recovery phase, including:

- managed retreat—policies for moving away from risk areas
- buyback—compensation schemes
- streamlined planning processes for rebuilding.

Barriers to integrating housing policy, settlement planning and disaster management include:

- differing work cultures and objectives—which can lead to variations in risk assessment
- differences in risk assessment, partly caused by a lack of understanding or awareness of the risk by agencies that do not work in this area on a daily basis.

Thus, there is a need for capability building and improved data availability and quality. Research participants reported that frequent organisational restructuring and the prolific use of fixed-term contracts also hinder coordination.

While local government is considered the most significant level for localising support to communities after disasters and for preparing and implementing prevention and mitigation strategies, this role is impeded by a current lack of resources, lack of investment and lack of a mandate. For example, an absence of necessary resources often prevents local governments from responding sufficiently to community housing needs during the disaster recovery phase. This includes a backlog in the issuance of planning and building permits for dwelling repair or replacement.

Local government should be:

- acknowledged for its central role in all stages of disaster PPRR
- strengthened to execute this role through financial support
- given the tools and frameworks for a better understanding of risk and implementation.

Disaster recovery evidence points to improved outcomes when decision-making is as localised as possible. In this regard, state and federal agencies and other decision-makers have an opportunity to invest in a long-term program of building local government authority mandate and capacity in all aspects of disaster management—especially preparedness and recovery.

The power of data insights plays a crucial role in enabling effective decisions for reducing and managing risks associated with exposure to disaster events. Data can be used to:

- inform mitigation strategies
- improve preparedness and coordination of response
- facilitate recovery.

However, while there is a growing understanding of the importance of data-driven decisions, the lack of data standardisation, availability and quality, paired with the number of actors involved in the decision-making process, hinders the effective use of data.

Effective collection and sharing of data increases efficiency, fosters collaboration, and provides the foundation for implementing evidence-based decisions to address exposure to natural hazards. However, to effectively use data and implement data-driven decision-making, there is also a need to address systemic issues relative to urban governance systems and data administration structure, including technical capacity building.

Urban governance systems

The research highlighted that while all actors involved in housing delivery—housing providers, private and public development organisations— rely heavily on planning frameworks and policies for their decision-making, these policy frameworks are not strong enough to address risk effectively. The inadequacy of institutional instruments—such as zoning, standards and building codes—in addressing disaster risk is linked to the following:

- A lack of responsiveness of these government instruments, with lengthy and complex processes required to update policies.
- The slow processes in embedding data in planning tools impacts trust in data, which means that data becomes a point of contention in the development approval stage.
- Policy reviews and updates are mostly politically driven. They are often initiated as a reactionary response to disaster events, rather than responding to improvements in data.
- A lack of clarity and conflict in priorities, and an incapacity to clearly manage a conflict of interest—namely housing growth, economic development and community needs.

Data use and administration

The issues of privacy and government data ownership remain the main hurdles to overcome in the journey to better decision-making. No advancement in data-driven decision-making related to disaster risk reduction in settlement planning and urban development is possible without 'putting the trust back in data'. This can only be done by addressing the perennial issue of data-sharing limitations through the establishment of stronger data-governance regimes.

Third parties—such as referral authorities, consultants or licensed practitioners—play an important role in data production and interpretation. They also play an important role in risk assessment as part of the planning processes—including risk assessments and analyses, such as in the case of Bushfire Attack Level (BAL) assessments. This is because planning departments have limited capacity to have expert resources in-house, especially in regional local government settings.

Currently, the state governments' investment in digital technologies and data-sharing platforms such as Digital Twins (DTs) provides an opportunity to better support and integrate data use in strategic planning and asset risk assessment. However, there is a lack of required digital capability and maturity in government and private institutional settings and support frameworks to procure, maintain and manage these tools. This lack of capacity limits the opportunities to fully leverage the effectiveness of these tools in the context of disaster risk assessment.

Effective risk communication is based on a shared understanding of risk among all parties involved through:

- coordination
- aggregation
- dissemination of information.

Due to the lack of clear legislative requirements related to risk disclosure, insurance has become the primary vehicle for households to identify a dwelling's risk exposure to natural events. Participants in the research—including those contributing to the inquiry—overwhelmingly emphasised the need to improve this sharing process, particularly to empower communities and individual households to make informed decisions and participate in the decision-making process.

Policy development options

Coordinating policy

Options for coordinating policy are outlined below.

Improve exchange between housing, planning and disaster management agencies: Establish increased exchange between agencies through secondments and working groups of officers at lower management levels, multi-disciplinary teams within agencies, and reciprocal capability building, such as building technical skills for risk assessment.

Clearer assignment of responsibilities: Clear responsibilities assist coordination and implementation, as other agencies know who is responsible for a certain task and so the responsible agency can develop clear strategies for their task.

Stronger consideration of disaster risk reduction in housing policy: Housing policy and housing strategies need to consider disaster risk more directly and explicitly. A crucial first step entails thorough risk assessments for housing developments to identify areas susceptible to increased hazard risk and to then prioritise low-risk locations. This will improve the contribution of housing policy to disaster risk reduction and preparedness.

Clearer priority setting for planning decisions: Clearer policy positions and specific regulations about priority criteria for urban development decisions in relation to disaster risk. These policies and regulations are necessary to assist decisions about where not to build or where to retreat. Clearer political priorities could, for example, include adding the protection of lives and mitigation and adaptation to climate change impacts into planning regulations.

Development of managed retreat and buyback policies and programs: These policies can support disaster risk reduction and speedy deployment post-disaster based on agreed parameters. This can include developing a database of suitable resettlement land and developing risk maps to identify land that is due for retreat.

Hazard-oriented planning policy, land use plans and referral agencies: Introduce requirements for comprehensive strategic-hazard-risk land use plans (on the local to regional levels). These plans could include decisions about exclusions of areas for urban development or for specific land use zonings. An example of this type of thinking is the Disaster Adaptation Plans (DAPs) that are under development in New South Wales. In addition, a planning policy developed by hazard agencies with a focus on their objectives could be considered in the development of land use plans. The establishment of referral directives for all natural hazards, similar to the fire agencies acting as referral agencies, would further support the regulated inclusion of hazard agencies to provide expert advice.

Streamlined planning processes and risk assessments post-disaster: In the recovery phase, there is a need for more flexible planning requirements for the provision of temporary housing, and potentially rebuilding, as well as for streamlined risk assessment, as this would support quicker rebuilding and relocation processes.

Evaluation of recovery programs and experiences for housing and planning: Further potential for improved coordination lies in the establishment of regular arrangements for evaluating recovery experiences with a focus on planning and housing decisions.

Responsibilities of different tiers of government: Organising the responsibilities between the three tiers of government more coherently will improve implementation and avoid duplication. Federal government could lead or coordinate decisions about data assumptions for risk assessment standardisation and support data sharing and availability; state government could lead studies and modelling for risk assessment, undertake evaluations when a disaster has happened, prepare policies for disaster recovery situations, and support local government in their response to disasters. Local governments, which are often overwhelmed and under-resourced, could implement risk assessments and develop comprehensive strategic-hazard-risk land use plans.

Coordinating responses

Options for coordinating responses are outlined below.

Emphasise preventative strategies: Adopt stringent land planning and zoning regulations to prevent the construction of new residences in hazard-prone regions, such as floodplains, and provide sufficient bushfire prevention measures.

Broaden post-disaster housing solutions: Employ diverse post-disaster options, including temporary housing and existing facilities—such as holiday parks, motels and hotels—to support local businesses and deliver urgent assistance. Prioritise meeting immediate needs while also having an eye towards supporting longer-term household and economic recovery at every opportunity. Options include on-property caravans, and assistance for constructing modular homes, coupled with the provision of amenities. Temporary housing villages should be a last resort: they are expensive, slow to build and can push problems down the road. And, if they are used, ensure a post-usage plan is in place that provides local benefits.

Formulate a comprehensive set of strategies for buybacks and controlled relocation: Advocate for buybacks and manage relocation as effective mitigation options, while acknowledging their complexity and potential divisiveness, and ensuring equitable and transparent procedures. The Victorian Government allocated $25m to acquire 116 houses devastated by the Black Saturday bushfires to safeguard high-risk communities. Regrettably, several residents had already determined their plans for rebuilding or transferring prior to the introduction of the repurchase program.

Localise community-driven recovery: Centralise the function of local government authorities (LGAs) in community mitigation and preparation planning to enable them to spearhead the identification of sites for managed relocation and the establishment of temporary accommodation solutions. Local government officials frequently discover they are inadequately prepared to oversee recovery initiatives, as numerous Council members are themselves impacted by the tragedy. The federal, state and territory governments ought to assist local governments in perpetually enhancing readiness by, for example:

- compiling a list of at-risk residents
- establishing an early warning system
- engaging communities in decisions that affect them
- implementing land use planning modifications informed by risk modelling.

Promote the institutionalisation of 'build back better' principles in post-disaster reconstruction: These principles could be underpinned by insurance and other structures that provide enhancements rather than simple replacements. Reconstructing with enhanced resilience and ensuring housing is safeguarded from floods and fires must be incorporated into the considerations of both government and private sector entities.

Revise home insurance policies: Tackle the rising costs of home insurance premiums by investigating alternate strategies that entail increased participation from the federal, state and territory governments to improve recovery capacities. The insurance experience varies significantly across each case-study area and incident type. It is evident that, in the absence of non-market action, insurance costs will escalate due to the rising frequency and severity of catastrophic occurrences.

Coordinating data

Options for coordinating data are outlined below.

Strengthen the digital capabilities and maturity of government institutions and professional bodies: To effectively implement digital technologies that support data exchange and analysis for decision-making, it is crucial that the involved government agencies reach a similar level of digital maturity. Efforts should focus on:

- building capacity by eliminating structural barriers
- introducing strategies that foster the creation and execution of new governance structures and protocols.

Develop robust and transparent data-governance frameworks: Improvement of coordination and standardisation of data-sharing practices and coordination of users across government agencies and other professional sectors is essential for improving disaster risk reduction and preparedness.

Revise and create adaptable and responsive risk assessment tools and data-recording mechanisms: Existing risk assessment methods are static and fail to account for shifts in risk levels over time due to interventions implemented to improve building resilience. To accurately record changes over time, systems must be implemented that can track and manage changes in risk levels effectively. This needs to be paired with legislative requirements that define how and when the risk is communicated through 'mandatory risk disclosure'. This is particularly relevant for homeowners, as it enables them to implement strategies to manage risk and make informed decisions when purchasing their homes.

The study

This AHURI Inquiry, *Housing policy and disasters: better coordinating actors, responses and data*, examines coordination in housing and planning policy and practice to improve disaster PPRR. To achieve this the Inquiry addressed three research questions:

1. How can institutional coordination strengthen housing policy and settlement planning in disaster prevention, preparedness, response and recovery?

The research investigated the role of housing policy and settlement planning in disaster prevention, preparedness, response and recovery. It focussed on government responsibilities—particularly for federal and state government, institutional arrangements and coordination mechanisms. Housing policy, settlement planning, disaster prevention, preparedness and response were examined. A focus was also on institutional arrangements and policy coordination frameworks.

2. What are the best housing disaster recovery approaches that meet both immediate needs and contribute to the prevention, preparedness, mitigation and prevention of future disasters?

The research comprised seven case studies across four states: Western Australia, New South Wales, Queensland and Victoria. It sought to capture in-depth insights from a range of key actors—for example, communities, responders, planners, insurance companies and property valuers—to address policy integration challenges and opportunities across jurisdictions and between levels of governments. The findings underscored the sheer complexity of post-disaster housing provision, and highlighted the forms of provision that meet both immediate needs and can contribute to longer-term recovery.

3. How can the coordination of data and actors involved in the housing supply process be improved to support and drive the delivery of safer and disaster-responsive housing and communities?

The research investigated how to better coordinate data to facilitate the delivery of improved, evidence-based housing-related decision-making at all levels of government. The project mapped data and processes and users' needs to inform natural hazard risk assessment and the evaluation of natural hazards on new housing stock, to reduce and mitigate the impacts of natural hazards. Research was conducted in the case-study states of Queensland, Western Australia, New South Wales and Victoria, with survey participation from government and industry representatives from all six states.

Each question was the subject of an AHURI Inquiry project, which are referenced below.

The research employed a mixed-methods approach to answer the three Inquiry Research Questions, and the Inquiry Projects' respective research questions, involving:

- a review of academic and grey literature from Australia and comparable countries, e.g. USA, New Zealand and Canada
- institutional and policy mapping of the institutional and policy environment for the coordination of housing policy, settlement planning and disaster preparedness and response
- semi-structured interviews with key informants
- interviews, focus group discussions and an online survey with community members about their experiences of disaster recovery
- a survey of key government and private industry representatives
- workshops with key government and private industry representatives
- a detailed review of seven post-disaster recovery events across four states in Australia, including bushfires, floods and a cyclone that took place between 2009–22.

The research was undertaken between May 2023 and November 2024.

The Inquiry projects' final reports, each of which provides a detailed research method, can be found as follows:

Institutional coordination: Kroen, A., Barnes, E., Hartley, C., Dodson, J., Butt, A. and Pawson, H. (2025) *Integrating housing policy, settlement planning, and disaster prevention, preparedness and response,* AHURI Final Report No. 435, Australian Housing and Urban Research Institute Limited, Melbourne. https://www.ahuri.edu.au/research/final-reports/435, doi: 10.18408/ahuri5333101.

Temporal coordination: Heffernan, T., Vahanvati, M., Halvitigala, D., Majumdar, A., McEvoy, D. and Sanderson, D. (2025) *Enhancing housing recovery policy and practice for improving community resilience to future disasters*, AHURI Final Report No. 439, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/439, doi: 110.18408/ahuri7133201.

Data coordination: Perugia, F., Babb, C., Scherini, R., Rowley, S., Logan, C., Shirowzhan, S. Lu, Y., Pettit, C. (2025) I*mproving coordination of data and actors for disaster-responsive housing and safer communities*, AHURI Final Report No. 436, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/436, doi: 10.18408/ahuri8133301.

1. Introduction

- Disaster prevention, preparedness, response and recovery (PPRR) is a critical area of focus in housing delivery. This is because of increasing climate-fuelled disaster threats combined with population growth.
- Disasters can have significant immediate and follow-on impacts on communities through housing damage, infrastructure destruction and service interruptions.
- Steps of disaster management—prevention, preparedness, response and recovery—are challenging and need to balance short-term needs with longer-term outcomes.
- Disaster management is complicated by Australia's split responsibilities for housing policy, settlement planning and disaster management across different federal, state/territory and local government agencies and departments.
- While federal and state governments are the main actors in disaster recovery in Australia, local governments play a central role in localising responses—but are usually under-resourced and overwhelmed.
- Current inefficient coordination practices constrain longer-term prevention and mitigation—or may even harm it—thus impacting support planning and housing recovery.
- Australian academic housing, disaster management and planning research tends to focus on different steps of disaster management, with inter-disciplinary integration generally underdeveloped.
- The growing grey literature on disaster preparedness and response also identifies integration challenges among policies and agencies, with settlement planning requiring further attention and practice guidance.

1.1 Policy context

Rapid-impact disasters triggered by natural hazards such as cyclones, floods and bushfires are set to increase (Royal Commission 2020). The potential for catastrophic damage to housing stock is compounded by population growth and settlement development patterns. For example, the 2019–20 Black Summer bushfires destroyed over 2,400 homes (Royal Commission 2020), while the 2022 NSW Northern Rivers floods inundated some 7,000 residences (Risk Frontiers 2022).

Given the significant scale of immediate and follow-on impacts resulting from housing damage and destruction—and the observed and projected increase in frequency and extent of disasters as a result of climate change (Royal Commission 2020)—there is an urgency to examine the current policy measures throughout all stages of the cycle of disaster management—in particular prevention, preparedness, response and recovery, (PPRR)—to identify improvements in institutional, temporal and data coordination.

Coordination concerning housing and disasters is complex. Housing recovery and the provision of temporary housing has been recognised as *'one of the most intractable problems'* in disaster response to solve (Ashdown 2011: 25). 'Temporary' housing is rarely temporary, and it is not unusual for families to live in temporary housing for years. Buybacks bring their own complexities, costs and community tensions. Measures of disaster prevention and preparedness are also challenging, as they relate to:

- housing and settlement planning
- balancing short-term needs with longer-term considerations
- aligning the complexities of regulations and policies to meet these ends.

Better coordination is needed, such as in data-sharing infrastructure and managing challenges resulting from organisations with competing interests or jurisdictions. This would help to:

- identify and prioritise responses
- inform policies that reduce and prevent future risks and hazards.

Inefficient coordination can constrain longer-term prevention and mitigation—or may harm it. This leads to:

- missed opportunities
- delays in critical decision-making
- duplication of efforts at times when resources may be scarce.

Due to Australia's three-tiered, federated model of government, responsibilities for housing policy, settlement planning and disaster management are split across different federal, state/territory and local government agencies and departments.

The federal government tends to set the overall framework and policy and distribute the budget accordingly, with states and territories (and, to a lesser extent, local governments) being the main implementors. This is certainly the case with housing and planning policy and practice, where the federal government has, over many decades, sought to exert influence through successive Commonwealth-State Housing Agreements, the latest of which is the National Agreement on Social Housing and Homelessness (NASSH) 2024–25 to 2028–29. In principle, this framework could provide guidance for housing and homelessness services relating to disaster management and response. However, this has not been the case.

A different, potentially significant new mechanism through which the federal government might, if it is implemented, be able to influence housing matters relevant to this Inquiry's focus is the National Housing and Homelessness Plan (NHHP). The plan outlines a 10-year strategy that sets out a vision of housing and homelessness policy in Australia. The inclusion of a section on the 'impact of climate change and disasters on housing security, sustainability and health' in the Issues Paper (2023) that preceded the plan highlights the issue's increasing role within Australia's housing policy landscape (Department of Social Services 2023). Future national housing policy development should consider housing in the context of climate resilience and disaster management.

With regard to settlement planning, the current Labor government shows a renewed interest in urban planning with the establishment of a Cities and Suburbs Unit. It signifies a return to committing to urban issues through the establishment of an Urban Policy Forum that will advise on the establishment and implementation of a new National Urban Policy (DITRDCA 2024). The section of the new policy of most relevance to this Inquiry Program is that achieving *'sustainable and resilient'* cities and communities is one of the three goals for Australia's urban development. Factors mentioned as influencing resilience include:

- promoting connection with green infrastructure
- co-developing climate adaptation strategies via partnerships across governments, industry and communities (Australian Government 2024).

Federal responsibilities have recently expanded through the establishment and strengthening of national bodies, such as the National Emergency Management Agency (NEMA) and disaster management agencies. However, processes, stages and policy frameworks tend to be organised at state and local scales. Table 1 provides an overview of key policy frameworks and legislation for housing policy, settlement planning and disaster management, while Table 2 maps the corresponding organisational structure.

Table 1: Key policy frameworks and legislation for housing policy, settlement planning and disaster management

Legislation, plans, policy	Disaster	Housing	Planning
Federal government	National Strategy for Disaster Resilience National Disaster Risk Reduction Framework Australian Disaster Preparedness Framework Australian Disaster Recovery Framework Australian Government Crisis Management Framework (AGCMF) Emergency response plans Australian Government Disaster Response Plan National Coordination Mechanism *National Emergency Declaration Act 2020* National Emergency Risk Assessment Guidelines (NERAG) Critical Infrastructure Resilience Strategy Disaster Recovery Funding Arrangements 2018	National Agreement on Social Housing and Homelessness (NASHH) (formerly National Housing and Homelessness Agreement [NHHA]) National Housing and Homelessness Plan	National Urban Policy City Deals National Construction Code (NCC)
State government	State Emergency Management Acts State Emergency Management Plans State Emergency Response Plans State Emergency Recovery Plans Hazard-specific legislation Climate Change Adaptation Plans (different in each state/territory)	Housing Acts Residential Tenancies Acts Housing Strategies (different in each state/territory)	Planning Acts Strategic Plans Planning Provisions (different in each state/territory)
Local government	Climate plans; resilience plans; emergency plans	Housing strategies	Planning and transport strategies

Source: Based on Kroen, Barnes et al. (2025)

Table 2: Key housing policy, settlement planning and disaster management organisations

Governance level	Disaster	Housing	Planning
Federal government	Minister for Emergency Management Department of Home Affairs National Emergency Management Agency (NEMA) Australia-New Zealand Emergency Management Committee (ANZEMC)	Minister for Housing and Homelessness Department of Social Services Housing Australia Building Ministers Meeting	Minister for Infrastructure, Transport, Regional Development and Local Government Department of Infrastructure, Transport, Regional Development, Communication and the Arts
State government	Emergency management agencies Recovery agencies Police services Ambulance services Medical services Fire services Environment departments	Department of Housing Housing authorities (named and organised differently in each state and territory)	Department of Planning Planning authorities (named and organised differently in each state and territory)
Local government	Environment areas	Housing areas	Planning and transport areas
Outside government	Responding organisations: e.g. Red Cross, Salvation Army Not-for-profit organisations, e.g. Disaster Relief Australia, community housing providers, Tenants Unions Volunteer organisations, e.g. State Emergency Services (SES), Rural Fire Service Community and Indigenous Groups Peak bodies, e.g. Australian Council of Social Service (ACOSS), Australian Local Government Association (ALGA) Utilities and infrastructure providers and critical infrastructure owners and operators Business and industry, including design, building and construction industries; insurance industry Landowners and landholders; natural resource management bodies		

Source: Kroen, Barnes, et al. (2025), based on Australian Institute for Disaster Resilience ([AIDR] 2023) (see this publication for more details) and individual Department websites.

Australia has employed the PPRR approach for the management of natural hazards in recent years, using shared responsibility between three tiers of government. A new AGCMF was published in September 2024, updating the long-used PPRR approach to now incorporate additional steps:

- prevention, preparedness, response, relief, recovery, reconstruction and risk reduction (PPRRRR).

The Disaster Recovery Funding Arrangements (DRFA) provide the main framework for how disaster costs (including those for housing recovery) and other expenditures are shared between federal and state governments. Other influential policy frameworks at the national level include the National Partnership on Disaster Risk Reduction, the National Strategy for Disaster Resilience, and the Disaster Ready Fund.

While federal and state governments are the main actors in disaster recovery in Australia, local governments also play a role. Local government is the level of government closest to the community, and it has a strong role to play in disaster management. Local governments:

- implement emergency plans and provide assistance to communities during disasters—often as the first responders
- are responsible for land use planning at the local level
- are responsible for taking account of risk assessments in land use planning to reduce hazard risk and implement education and awareness measures.

When a disaster occurs, local councils:

- liaise with higher-level agencies, such as state response and recovery agencies, for additional support with response and recovery activities when needed
- continue to provide general services during emergencies, such as waste collection, pollution control, water provision, wastewater treatment and stormwater drainage (Australian Institute for Disaster Resilience [AIDR] 2023).

When called upon, with central funding support, local councils have been responsible for administering property buyouts for flood-impacted or high-risk areas. They are also the level of government that will typically invest in local risk mitigation actions, such as the construction of levees and dykes after a flooding event.

However, research participants and panellists interviewed for this research emphasised that local government does not have sufficient capacity and resources to undertake all the tasks that are expected of them. In particular, local councils struggle to:

- respond to the planning and housing needs of the community in disaster response and recovery phases
- deal with the number of planning and building permit requests they receive after a disaster, when the number of applications sharply increases.

Disaster prevention and preparedness are more in the remit of the day-to-day activities of local governments, such as planning decisions and the development of Local Emergency Management Plans. However, for smaller regional councils, there can also be low capacity for these phases, as they often do not have the knowhow in-house (McGregor, Parsons et al. 2022).

A Council's capacity refers to the number of dedicated and specialist staff it has. This capacity can influence the integration of housing, planning and disaster management at the local level. How these functions are integrated differs between councils. In some councils, planners work closely together with emergency management, while in others they do not. In interviews conducted for this research, Local Government Associations were mentioned as important stakeholders that could provide guidance to local government on capacity management during emergencies.

To facilitate these changes, there needs to be a national approach to collating and managing relevant data and information. This has been identified as a priority in many inquiries and reports, including the recent Royal Commission (2020).

The Royal Commission (2020) especially recommended that the federal government takes a leading role as coordinator and facilitator by setting common standards and data harmonisation that can facilitate decision-making. While there have been attempts to better embed natural hazard data in decision-making (Gonzalez-Mathiesen, Ruane et al. 2021), there is also awareness of the barriers, which include:

- the growing recognition of data limitations (Fahad, Hossain et al. 2023)
- the high number of actors involved
- lack of standardisation in data collection, processing and distribution
- the limits on interoperability because of data availability and quality assessment (Migliorini, Hagen et al. 2019).

It has also been recommended that building capability in modelling and providing better information about vulnerability and exposure risks is of urgent importance.

1.2 Existing research

Existing academic literature has thus far failed to address the systematic engagement between housing policy, settlement planning and disaster management.

On the one hand, Australian housing research based on disaster PPRR is limited, while disaster management research literature only occasionally addresses housing policy, mainly focussing on impact and recovery rather than preparedness and prevention.

On the other hand, the planning literature in the Australian context has considered disaster management in greater detail, particularly in relation to disaster PPRR (see for example, March, Nogueira de Moraes et al. 2020; Ruane, Swapan et al. 2020), but thoughts on integration have remained generally underdeveloped.

Similar to the academic literature, the growing grey literature on disaster preparedness and response—such as successive reports and commissions of inquiry into specific disaster case studies (see for example, Royal Commission 2020; O'Kane and Fuller 2022; VBRC 2010)—identifies integration problems of policies and agencies. However, most do not refer to housing policy. The exception to this is the area of housing recovery, which has been the subject of several studies (Corbin 2017; Diaz, Behr et al. 2022; Safapour, Kermanshachi et al. 2021; Sapat 2016).

Grey literature also identifies settlement planning as a key topic that requires further attention and practice guidance—especially in addressing disaster risks (see for example, AIDR 2020). When looking at post-disaster reconstruction, academic research highlights several success factors, which include the involvement of:

- the government in developing adequate policy responses
- other actors in the delivery of programs, community participation and decision-making, such as in securing building materials and tradespeople (Azmeri, Mutiawati et al. 2017).

Grey literature has also identified a range of other factors where limited guidance is emerging. These depict various vulnerabilities that may be experienced by affected households, such as:

- access to shelter and amenities
- livelihood management—where an individual's business and residence were both affected
- damage to local and regional infrastructure (Irajifar, Alizadeh et al. 2015).

Within the Australian context, the main identified issues are the lack of standardisation in:

- flood analysis (Alamdar, Kalantari et al. 2017; Kelly, Schwarz et al. 2023)
- bushfire hazard datasets (McDonald and McCormack 2022)
- tropical cyclone analysis (Mortlock, Metters et al. 2018).

Lack of standardisation leads to inconsistency in data formats and classification methods. This limits opportunities to compare and exchange datasets and analyse results and collaborate across different sectors and diverse geographical regions.

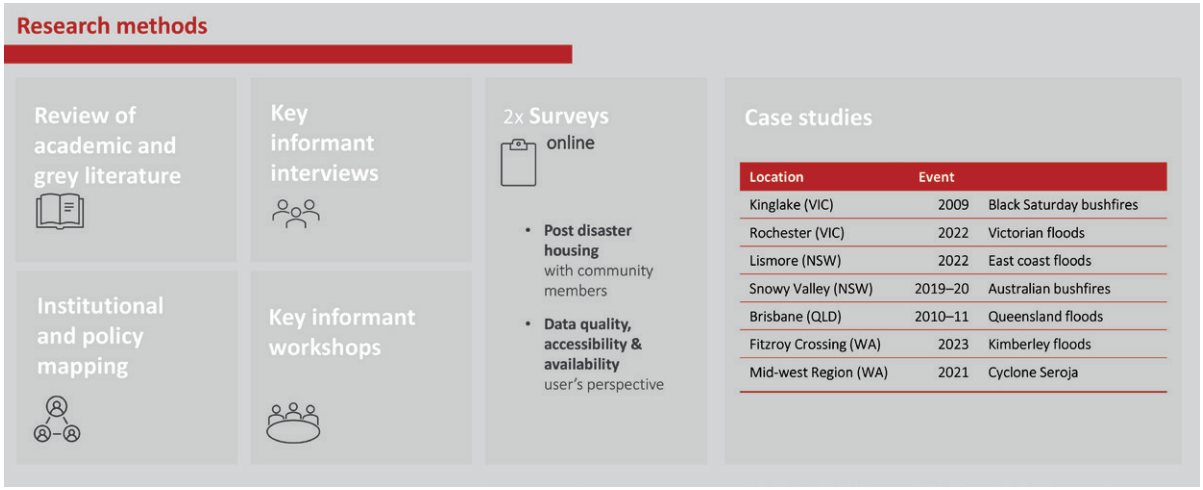
The temporal and spatial resolution of disaster datasets is also limited by changes in reporting practices over time, which affect data comparability (Hamidifar and Nones 2023; Nones, Hamidifar et al. 2024). These inconsistencies impede data aggregation and comparison, and restrict the use of this information for predictive analytics and risk assessment.

1.3 Research methods

The research employed a mixed-methods approach to answer the three Inquiry Research Questions (see Figure 1), and the Inquiry Projects' respective research questions.

1. How can institutional coordination strengthen housing policy and settlement planning in disaster prevention, preparedness, response and recovery?
2. What are the best housing disaster recovery approaches that meet both immediate needs and contribute to the prevention, preparedness, mitigation and prevention of future disasters?
3. How can the coordination of data and actors involved in the housing supply process be improved to support and drive the delivery of safer and disaster-responsive housing and communities?

Figure 1: Inquiry program: overview of research methods used



Source: Authors.

Case studies were undertaken in Victoria, New South Wales, Western Australia and Queensland. These study sites were chosen because of the prevalence and diversity of disasters that occur in these states—in particular bushfires, floods and cyclones—as well as their varying approaches to disaster prevention, preparedness, response and recovery.

Review of academic and grey literature

Three separate reviews of academic and grey literature were conducted. The reviews focussed primarily on literature in the Australian context, as well as international literature with potential applicable relevance to Australia—namely New Zealand, Canada and the USA. Grey literature reviewed included reports from Royal Commissions, independent and parliamentary inquiries, as well as those produced by non-for-profit and community organisations.

Search topics included:

- governance and policy integration, along with housing and planning policies relevant to disaster preparedness and response
- governance, policy integration, coordination of agencies and actors, and disaster policy frameworks relevant to housing and planning
- major national and state frameworks for housing policy, settlement planning and disaster preparedness and response
- factors contributing to housing vulnerability in relation to natural hazards.

Institutional and policy mapping

Mapping was used to identify and visualise the institutional and policy environment for the coordination of housing policy, settlement planning and disaster preparedness and response. Its focus was at the federal and state levels—primarily Victoria, New South Wales, Western Australia and Queensland—with local government arrangements considered where relevant. The findings showcase the set of institutional arrangements and policy frameworks currently operating in housing policy and settlement planning in relation to disaster preparedness and response.

Semi-structured interviews with key informants

Seventy-three semi-structured interviews were conducted with key informants. Selections were first made by shortlisting the government, non-profit and industry organisations that worked in the relevant fields, based on institutional and policy mapping. A coordinated approach was used to ensure that all relevant stakeholders relevant to the Inquiry Program were identified. Representatives of these organisations were then identified via the research teams' professional networks, public websites and by AHURI's recommendations.

Interviews focussed on knowledge about housing policy and settlement planning, emergency, temporary and long-term housing policies and programs before and after disasters, including the strengths and challenges of current approaches and future opportunities for optimising post-disaster housing outcomes. A small number of interviews also focussed on understanding the decision-making process within informants' organisations around risk assessment associated with natural hazard exposure. Key informants were from community groups, non-governmental organisations (NGOs), building and land development industries, emergency management organisations, housing providers, lenders and insurers, and all levels of government (federal, state and local). Interviews were recorded and transcribed. The resulting transcripts were then analysed inductively with the aid of analytical software (NVivo).

Representatives of the planning and development industries were identified through professional and industry representative organisations such as the Planning Institute of Australia and the Community Housing Industry Association. Given the valid survey sample size (n=125), basic statistical analytical methods such as frequencies and cross-tabulations were employed. The findings informed subsequent workshop discussions, which focussed on mapping the data needs of key actors at different stages of housing delivery decision-making processes and designing a process for integrating the use of assessment and forecasting tools into these processes.

Workshops and focus group discussions

Three workshops were held in Western Australia, Victoria and New South Wales. Selected interviewees were asked to participate in the workshops to ensure representation from various stakeholder groups, including state and local government representatives, planning and emergency management agencies, community and state housing provider agencies, state development agencies, and private developers. Research for the Queensland case study comprised a desktop literature review and online interviews with key informants.

A number of focus group discussions were held with communities that had recently experienced disasters—for example, in Lismore following the 2022 floods, and Batlow following the 2019/20 bushfires. Participants were asked to reflect on their experience of housing and service delivery, insurance, government funding and support, and the degree to which they felt their community was included in making decisions.

Online survey and workshops with key government and industry representatives

An online survey was conducted to capture the level of importance respondents placed on key elements relating to risk assessment for bushfires, flooding and cyclones across all stages of the planning and development of housing, including the quality of data accessed.

Inquiry Panel meeting

A one-day Inquiry Panel meeting hosted by AHURI was conducted in person in Melbourne on 8 October 2024 with seven government, non-government and private sector representatives.

The purpose of the Inquiry Panel meeting was to draw on the policy and practice expertise of the panellists, and to consider the evidence and the outcomes of the research to address the priority policy issues. The research team presented summarised findings of the three Supporting Research Projects, how they each addressed the three Inquiry Research Questions, and the priority policy issues they identified. A series of potential improvement pathways that might address these priority policy issues were also presented to the Panel, to seek their expert reflections on:

- the feasibility of these pathways fitting in with or disrupting existing systems
- further gaps that will require more research and policy attention
- other potential policy and practice innovations that may not already have been included in the research.

The seven attendees were specifically asked to consider the evidence presented within the frame of the four discussion questions:

1. Do the conclusions and recommendations presented go far enough?
2. What are the policy opportunities and barriers that would impact the feasibility of the suggested actions for improvement?
3. What other enablers and barriers do you anticipate regarding the feasibility of these suggested actions (e.g. inter-governmental coordination, regulatory barriers, funding), and which of these should be prioritised?
4. What other policy or practice innovations are there in these areas that may already be in development?

The panel discussion was not recorded. Instead, the research team took detailed notes on the day, which were then collated and analysed inductively and thematically using the four discussion questions that framed the day's discussion. The outcomes of these discussions are detailed in this Inquiry Final Report.

For further details on the methods employed for this Inquiry and its support research projects, please refer to the Final Reports of the respective projects (Heffernan, Vahanvati et al. 2025; Kroen, Barnes et al. 2025; Perugia, Rabb et al. 2025).

2. Coordination and integration of housing policy, settlement planning and disaster management

- **Coordination and integration of disaster management, housing policy and settlement planning has increased in recent years—but there is still significant scope for improvement.**
- **State and territory governments have the main responsibilities for disaster management, housing policy and settlement planning.**
- **There is a need for stronger consideration of disaster risk reduction in housing policy and clearer priority setting for planning decisions.**
- **Coordination can be improved through clearer assignment of responsibilities between agencies and different tiers of government.**
- **Options for planning policies and programs include managed retreat and buyback schemes, hazard-oriented planning policy and streamlined planning processes post-disaster.**
- **Distinct learnings can be made through the evaluation of housing and planning recovery programs and experiences.**

Disaster risk to housing is a function of building design and settlement planning. Both are influenced by wider policy and institutional frameworks for disaster prevention and response. With the increasing number of large-scale disasters in Australia, the awareness of the need for coordination is growing, along with awareness of the interdependencies between housing, settlement planning and the disaster cycle that comprise disaster PPRR.

The coordination and integration of the work of hazard and emergency, planning and housing agencies has already improved since the early 2010s, particularly due to insights from Royal Commissions and other inquiries into major disasters, which led to subsequent changes in regulation and practice. However, the integration needs to be further advanced and 'disaster thinking' still needs to be more integrated into housing policy and settlement planning.

Similarly, although coordination of institutional responsibilities is a major theme in disaster management policy and public debates (Carayannopoulos 2017), housing policy rarely appears in these discussions. Settlement planning is discussed to a somewhat broader extent, particularly in relation to planning for bushfire-prone areas and, recently, in relation to building on flood plains, but integration is still relatively weak (Ruane, Swapan et al. 2020).

This chapter presents the common understanding of the role of housing policy and settlement planning in disaster preparedness and recovery. It looks at current arrangements for coordination and integration, focussing on institutional arrangements, planning coordination and disaster response. It highlights existing areas of coordination and overlaps between the fields, and makes suggestions on how housing and planning policy frameworks and institutions can better integrate with disaster preparedness and response policies, frameworks and practices. The analysis focusses on the state government level, highlighting arrangements within that level of government, along with the roles of federal and local government and broader stakeholders where relevant.

2.1 Policy context

2.1.1 The roles of housing and planning in disaster management

Disaster management is generally divided into four types of actions: prevention, preparedness, response and recovery (abbreviated as the PPRR approach). The components of the PPRR approach are outlined below.

Prevention is also called disaster risk reduction (DRR) or mitigation, and aims at either avoiding or decreasing the impacts of a hazard. This also involves excluding some high-risk areas from urban development so that less infrastructure and fewer people will be impacted in the event of a disaster.

Preparedness aims at tools or knowledge to increase the chances of survival and to minimise financial and other losses.

Response takes place when disasters occur. It aims at reducing the impact of a disaster to prevent further suffering or financial loss and other losses.

Recovery begins after the immediate response has ended, and aims at returning victims' lives back to a 'normal' state following the impact of a disaster. The recovery phase can take months or years, and sometimes a distinction is made between the early and later recovery phases (AIDR 2023; Coppola 2015).

In general, housing policy has a stronger role in *response* and *recovery* than in prevention and preparedness, although construction policies play a role in the latter two phases. As houses are often damaged or destroyed when disasters occur, there is a need for temporary shelter and housing, and the need to repair or find/build new permanent housing, either by:

- rebuilding in the same area
- building in a different area
- moving to a different area.

Broader policy decisions and the broader housing market also play into this, as the ease of finding temporary and permanent housing is impacted by the overall conditions of the housing market in the impacted areas.

In contrast, settlement (or land use) planning usually has a stronger role in *prevention* and *preparedness*. Land use zoning can prevent development in high-risk areas or appropriately influence what kinds of development can happen—both of which can reduce the impact of disasters on housing and the community. Land use zoning can also support the protection of ecosystems, which in turn can reduce the impact of a hazard—for example, by making landslides or flooding less likely. Regarding *preparedness,* risk assessment of areas and subsequent development overlays—such as a Bushfire Management Overlay— which set out standards that require certain building characteristics, and locations for critical response infrastructure are all related to settlement planning. The need to take into account future challenges and likely changes, such as rising sea levels, is also related to disaster preparedness.

2.1.2 Key developments, policies and frameworks for disaster management, housing policy and settlement planning

Disaster management

Australian approaches toward disaster management have changed constantly at the national, state and local government levels in recent years. This is because of:

- the introduction or adoption of international frameworks
- lessons learned from previous disasters, Royal Commissions and inquiries
- the increased risk and occurrence of large-scale disasters in Australia.

Overall, there is now a stronger emphasis on the management of disaster risk rather than only managing disasters. This is due, among other things, to international frameworks and insights such as the global Sendai Framework (see Section 4.1), which is extensively referred to in the National Disaster Risk Reduction Framework (Department of Home Affairs 2018b).

Avoiding disasters and reducing their impacts decreases the suffering and losses, but also has financial advantages—as reduced impact means that less money will be needed to be spent on response and recovery. Although the focus has shifted to disaster risk reduction (DRR), the phases of preparedness, response and recovery are also still vital, and strategies exist at the national, state and local levels to address these phases, such as the:

- Australian Disaster Preparedness Framework (Department of Home Affairs 2018a)
- Australian Disaster Recovery Framework (CORS 2022).

Similarly, the National Strategy for Disaster Resilience (COAG 2011) emphasises the need for a greater focus on prevention, preparedness and building capability.

Thus, there is a large and expanding disaster management policy and institutional framework operating across federal, state/territory and local jurisdictions in Australia. This framework and corresponding governance structures are in constant evolution, with new elements and adjustments being developed regularly and relevant agencies being established or restructured.

Housing policy

Housing policy is a central and current policy arena in Australia, with a high number of recent and planned policies and frameworks, such as the:

- National Housing Accord
- planned National Housing and Homelessness Plan (NHHP)
- Victorian Housing Statement
- Queensland Housing Plan.

Reasons for this attention to housing policy include:

- the ongoing and increasing gap in housing provision compared to housing demand—particularly in Australia's larger cities
- the ever-increasing house and land prices in most capital cities (and other regions), which make finding adequate dwellings challenging for households.

Moreover, constrained local housing markets can impact disaster response and recovery activities, as will be explained further below (see Section 3.2).

The National Housing Accord sets an aspirational target of 1.2 million new, well-located homes over five years from mid-2024. Similarly, some state governments have developed housing targets, aiming to increase the number of dwellings in the relatively near future. Local government then needs to work towards achieving housing targets (which are specified in some states) and to prepare and coordinate the relevant processes for building those new homes.

However, these statements and policies are largely focussed on building new housing and less on the extent that locations are suitable in the context of disaster risk reduction or disaster preparedness. While the National Housing Accord refers to well-located homes, it does not specify what 'well-located' means, nor does it have mechanisms in place to assess disaster risk for these new homes. Similarly, as was highlighted in the Panel discussion, housing statements generally do not mention climate change and the need to adapt housing to a warming climate.

However, the consideration of disaster risk, disaster impact and impacts of climate change is increasing. For example, the 2023 Issues Paper for the anticipated NHHP included a section entitled 'The impact of climate change and disasters on housing security, sustainability and health' (Department of Social Services 2023). It is also worth noting that the State of the Housing System report recently released by the National Housing Supply and Affordability Council (2024) included climate change as a complex risk factor that affects housing through:

- direct physical risk
- indirect pricing effects
- wider impacts on financing and insurance sectors.

The report also noted disasters as a contributor to homelessness (National Housing Supply and Affordability Council 2024: 121). However, its set of 10 recommendations for policy development did not include disaster preparedness or response.

Settlement planning

Policies and frameworks for settlement planning are largely developed at the state and territory levels. The introduction of regulations for disaster risk reduction and prevention, and a focus on how planning can contribute to housing targets are both relevant in the context of disaster management and housing policy. Disaster risk reduction regulations have largely been established based on learnings from previous disasters—particularly through inquiries and Royal Commissions. For example, since the 2009–10 Victorian bushfires, regulations about bushfire management overlays have been introduced and made more consistent and stringent in Victoria (VBRC 2010). Similarly, the flood inquiry in New South Wales led to recommendations in relation to land use planning and flood risk (O'Kane and Fuller 2022).

While planning is primarily a responsibility of states and territories, there is renewed interest in urban planning at the federal level under the current Albanese government, with the:

- establishment of a Cities and Suburbs Unit within the Department of Infrastructure, Transport, Regional Development, Communications and the Arts
- publication of the new National Urban Policy in December 2024 (Australian Government 2024).

2.2 Current arrangements of coordination and integration

While there is a need for housing policy, settlement planning and disaster management to be integrated and coordinated, this generally happens only to a certain extent in Australia. The clearest coordination efforts for housing policy are in relation to disaster preparedness, response and recovery. For planning, coordination efforts are generally focussed on disaster prevention and preparedness.

2.2.1 Formal coordination structures and interactions between housing policy, planning and disaster management

Formal interaction between housing and disaster management occurs particularly through emergency management plans. Formal interaction between settlement planning and disaster management occurs through fire agencies being referral agencies and—to some extent—also emergency management plans.

Emergency management plans are largely operational plans, and determine tasks and responsibilities during an emergency, mainly for the response during the disaster but sometimes also for recovery—although this is mostly specified in specific recovery plans (e.g. the NSW Recovery Plan 2023). Emergency management plans are developed both at the state and the local level. Furthermore, regional or district emergency committees prepare Regional or District Emergency Management Plans (AIDR 2023). At the national level, the National Emergency Management Agency of Australia (NEMA) maintains emergency response plans, based on the Australian Government Crisis Management Framework (AGCMF).

State Emergency Plans determine the responsibilities of different agencies during a disaster. Generally, emergency management agencies have the role of coordinating State Emergency Management Plans and of activities before, during and after major emergencies—including the management of the consequences of an emergency and its recovery. This includes coordination with housing and planning agencies about their roles in an emergency situation.

Housing and planning agencies are both involved in the emergency plans and have specified responsibilities for response. However, the responsibilities of planning agencies refer more to buildings and infrastructure, and settlement planning is generally not involved in the response to disasters. Housing departments are particularly involved in emergency accommodation.

In New South Wales, an additional path of interaction and integration between disaster management and land use planning is being established through the recent State Disaster Mitigation Plan (SDMP) and place-based and community-centric Disaster Adaptation Plans (DAPs), which are currently being developed. These plans are intended to provide a mechanism to consider emergency and recovery arrangements in strategic land use and infrastructure planning. They also focus on reducing the impact and cost of natural hazards. The SDMP and DAPs are complementary to the state, regional and local Emergency Management Plans and Recovery Plans that detail emergency management arrangements (New South Wales Reconstruction Authority 2024).

A further form of formal interaction between disaster management and settlement planning is based on fire agencies being a referral agency for new development in bushfire-prone areas. This means that fire agencies provide expert advice to councils on:

- permit applications in relation to bushfire protection
- whether a permit should be granted.

For other natural hazards, there are generally no specific referral agencies. Planning authorities still need to give regard to these hazards, but without referring the application to other agencies for expert advice.

Thus, responsibilities and coordination in the response phase are generally well organised through emergency management plans, but responsibilities and coordination for prevention, preparedness and recovery:

- are often not clearly defined
- change due to restructuring of agencies and changes in government policies toward agency mandates.

Nevertheless, there are further coordination roles of disaster management agencies that relate to the other phases. For example, Emergency Recovery Victoria (ERV) is a coordination agency that works closely with all levels of government, agencies, industry and the impacted communities to make sure that recovery programs are delivered effectively for communities. This includes working with planning and housing agencies.

2.2.2 Existing areas of integration between housing policy, settlement planning and disaster management

This section gives a brief overview of how housing policy and settlement planning are currently connected to disaster management, and common tasks and existing areas of integration.

Housing policy

Housing agencies are commonly involved in disaster preparedness, response and recovery. Disaster preparedness involves:

- clarification of responsibilities for response in emergency management plans
- clarification of responsibilities internally in housing agencies
- ensuring the preparedness of public housing assets and their residents.

Disaster response is related to emergency accommodation as a direct response, and often related to financial assistance when community or welfare responsibilities are located in the same Department. Housing agencies are also responsible for the response for the public housing that has been impacted. While the focus in the response phase is on emergency accommodation and preventing homelessness, some of the accommodation found may already be temporary accommodation for the initial recovery phase.

The disaster recovery phase is related to housing in the context of:

- interim accommodation
- rebuilding housing where feasible
- finding new permanent housing for relocating affected households.

Broader policy decisions and the broader housing market also play into the recovery process, as the ease of finding temporary and permanent housing is affected by the overall situation of the housing market in the impacted areas.

However, housing recovery is not always the task of housing agencies. In Victoria and Western Australia, the responsibility for housing recovery has gone back and forth between hazard agencies, housing agencies and local government. In New South Wales and Queensland, housing recovery is the task of the Reconstruction Authority and not the housing agency. As housing agencies are generally responsible for delivering and managing social housing, they have a particular responsibility for residents of social housing, and also need to repair damaged public housing assets. Housing recovery is discussed further in Chapter 3.

Housing agencies are not often involved in disaster prevention or disaster risk reduction areas. The main influence they can have in these areas is through decisions about the location of public housing and implementing relevant building codes—for example, concerning bushfire protection. However, this is not necessarily a fundamental basis of how housing policy is currently considered. While there are specific policies for building or rezoning, there are no comprehensive strategies that take into account housing targets and the location of housing in relation to disaster risk. By contrast, as was discussed in the Inquiry Panel, community housing providers do assess the locations of their housing in relation to disaster risk and may decide not to build in certain areas if the risk is too high.

Settlement planning

Settlement planning is largely involved in disaster risk reduction, preparedness and recovery, but generally not involved in disaster response, as its role is more strategic and future-oriented. However, other divisions of planning agencies play notable roles in recovery in the context of infrastructure and ensuring connectivity.

The role of planning in relation to disaster risk reduction is mostly in the context of steering development away from high-risk areas and considering hazard risks and climate change impacts in planning urban development. This includes taking into account where certain natural characteristics or environments are of particular importance for avoiding hazard risks. Mechanisms and tools include:

- land use zoning and design controls, which can avoid urban development in high-risk areas and improve resilience of buildings in lower-risk and medium-risk areas.
- managed retreat policies, which involve moving housing and settlements away from very high-risk areas
- buyback policies, which offer incentives to landowners to move away from high-risk areas.

(Managed retreat and buyback policies are discussed further in Sections 2.3 and 3.3.)

Decisions for managed retreat are often politically difficult because of the impacts on residents, and they need to be communicated extremely well. In the interviews and panel discussion conducted for this research, it was also noted that planning decisions consider several outcomes, which means that tensions between disaster risk reduction and environmental, social and economic development outcomes exist—and urban development might go ahead despite disaster risk.

The role of settlement planning in disaster preparedness includes decisions about:

- risk assessment of areas and subsequent development overlays
- land use zoning
- design controls
- locations for critical response infrastructure—for example, emergency shelters and evacuation routes (AIDR 2020).

While building codes are not strictly the responsibility of planners, their decisions for zoning and overlays—such as the Bushfire Management Overlay and subsequent Bushfire Attack Level (BAL) assessments—influence where building codes come into effect requiring specific standards for properties and buildings. Building standards are an important tool, particularly for managing risk in existing areas. They are based on the National Construction Code (NCC), which aims to achieve national standards of safety, health and sustainability for buildings.

As settlement planning is looking towards the longer-term future, it also has to anticipate future challenges and changes for land use plans, such as climate change projections and their impact on changing weather patterns and sea levels, population growth, and broader impacts of urban, economic or environmental policies. These changes can concern existing and future development. Risk assessment decisions need to be supported by a good understanding of the risks, by planners as well as politicians and the community. This requires:

- improving the quality and availability of data
- making decisions about the consistent use of databases and modelling
- making the risk data available to the public
- improving capabilities on how to understand and use the data (see Chapter 4).

In disaster recovery, settlement planning guides decisions on how to rebuild communities and infrastructure and whether or not rebuilding should occur in certain areas. Settlement planning in disaster recovery includes:

- general planning processes—such as permits for temporary housing
- assessing and issuing building and planning permits for rebuilding
- potentially finding suitable locations for relocation.

As planning requirements can slow rebuilding or provision of temporary housing, there is a need to investigate whether more flexibility or acceleration is possible without compromising on safety or environmental regulations or necessary quality assessments. In recovery, managed retreat and buyback schemes come into play; these schemes should be prepared pre-disaster so that they can be implemented quickly after a disaster has occurred. Relocation and buyback schemes are sometimes also the tasks of the Reconstruction Authorities, as is the case in New South Wales and Queensland.

2.2.3 Effectiveness and gaps of current integration arrangements

As stated previously (see Section 2.2.1), formal interaction between housing policy, settlement planning and disaster management occurs particularly through emergency management plans and fire agencies as referral agencies for planning. State emergency management and recovery agencies or hazard agencies coordinate disaster preparedness, response and recovery with other state government agencies and further stakeholders, including housing and planning agencies. This is also true, to some extent, for disaster prevention. This coordination works well, generally, and the agencies have established good processes for coordination. However, their knowledge and 'disaster thinking' overall still need to be better integrated with housing and planning agencies on a day-to-day basis.

Gaps

Disaster thinking is often not integrated into the day-to-day activities of agencies and government—as disasters or hazard events are still considered exceptional circumstances that are unlikely to happen. This can be caused by a lack of understanding or awareness of the risk if, for example, data availability is low, or if interactions with hazard agencies are not common. For example, while there is a thorough approach to organising emergency housing in housing agencies, other parts of the agency often do not integrate disaster thinking into their activities. This includes issues like housing supply and location of housing, where increased risk of disaster and response to climate change impacts are often not integrated.

Thus, for housing policy, there is a need to accord greater priority to disaster risk reduction. This could include:

- the assessment of suitable locations in relation to hazard risk
- a strategy of compact development to avoid growing out in higher-risk areas
- the improved resilience of housing stock.

For settlement planning, disaster risk reduction is more integrated into day-to-day activities due to legislation and requirements, but decisions are sometimes based on outdated risk information, and other objectives such as urban growth and economic development are prioritised. Overall, agency coordination between planning and disaster management agencies could be extended in the recovery phase and deepened for disaster risk reduction. While disaster risk reduction is embedded strongly into bushfire planning, it is less clearly regulated for other natural hazards. Streamlined planning processes and policies for managed retreat and buyback schemes can support recovery.

Differing work cultures and loss of institutional knowledge

Differing work cultures and objectives of disaster management, housing policy and settlement planning agencies create obstacles to integration and coordination. For example, the objectives of:

- *hazard agencies* are to save lives and reduce the risks to lives
- *planning agencies* are to support the orderly development of growth, which includes finding spaces for urban development
- *housing agencies* are 'to maximise the opportunities for all people … to have access to secure, appropriate and affordable housing' (Housing Act 2001 No. 52 NSW).

These are different underlying objectives, which do not necessarily contradict each other but do influence the approach and activities of the different agencies, and can hinder joint strategies—particularly in prevention.

Another common problem is the loss of institutional knowledge that can result from staff fluctuation, which can be due to frequent organisational restructuring and the prolific use of fixed-term contracts. For instance, in Victoria, many of the contracts in Emergency Recovery Victoria (ERV) are time-limited, and ERV, as well as the Department of Families, Fairness and Housing (DFFH), the Department of Energy, Environment and Climate Action (DEECA) and the Department of Transport and Planning (DTP) have recently experienced or are experiencing restructuring. Such restructuring changes responsibilities, contact persons and familiarity with specific regulations, cooperation structures etc. Establishing more regular exchanges between agencies and clear political priorities and frameworks could assist with improved integration and coordination.

Risk assessment and acceptable risk

For disaster preparedness, emergency plans provide for good coordination and integration between the different agencies.

Disaster management and planning have different work cultures. One question related to that difference is in:

- how risks are assessed
- what risks are considered acceptable.

In other words, is the assessment of disaster-prone areas too cautious? Or not cautious enough?

For example, in Western Australia the assessment of bushfire-prone areas is currently being reviewed by the state government, as it is generally thought that the assessment was too cautious or at least not fine-grained enough, and thus is too prohibitive towards urban development in certain areas. In contrast, recent floodings in Western Sydney and in Melbourne along the Maribyrnong River have shown that the floodplain overlay may not have been cautious enough. Reasons for poor decisions in risk assessment can include growth or development pressure, and poor availability or knowledge of data.

A further point mentioned in the interviews was the public availability and discussion of risk assessment so that the community is aware of the risk and can thus increase their preparedness—and so can the staff in planning and housing agencies

Resource capacity and redundancy

An element that showed up in the analysis is the tension between disaster preparedness and efficiency, and the cost of government infrastructure and assets (or other infrastructures and services). The question is to what extent 'redundancy' is needed or can be provided—in other words, the 'additional' capacity that is needed for different types of infrastructure, assets and services to facilitate disaster response and recovery.

For housing, this includes the question of how flexible the housing market needs to be—particularly the rental market—and how this can be supported. For settlement planning, this is related to infrastructure, such as roads, telecommunications or emergency and evacuation centres. For example, if a region does not have many roads, it might get disconnected if those roads are inaccessible after a disaster. But at the same time, developing and maintaining a road network is expensive for governments and may not be considered efficient or prudent government expenditure in remote or regional areas if these roads are not needed under most other circumstances. Similarly, telecommunication networks and structures also need back-up options and improved resilience and connectivity (Speidel 2023). This is a tension or trade-off where political leadership is needed.

Changing responsibilities for temporary housing provision

The coordination between housing policy and disaster management in the recovery phase is particularly important for temporary housing provision. In this context, the responsibility for the provision of temporary housing and its coordination is not always clearly specified and can differ between disaster occurrences.

In Victoria and Western Australia, the responsibility for providing temporary housing has moved between different agencies over time or between disasters—which makes a consistent and coordinated approach difficult.

In contrast, in New South Wales, the responsibility now lies clearly with the NSW Reconstruction Authority, irrespective of disaster categories. Local housing services and welfare assistance providers support the state government with this responsibility, often acting as case managers and service navigators within local communities. Additionally, interviewees stated that funding for temporary accommodation is incident-driven and that there is not a best practice or strategy for providing temporary housing.

Planning decisions and processes in the recovery phase

In the context of the role of settlement planning in disaster recovery, the issue is less about integration between disaster management and planning and more about how planning can and should support recovery.

For example, potential tensions exist between:

- the objective to allow temporary housing on the impacted property as soon as possible so that households can move back for the rebuilding process
- the decision about whether the land is still suitable for building or not.

Therefore, these decisions need to be made as early as possible, to avoid temporary homes being established on land that is later considered unsuitable for rebuilding. Developing a database of land where managed retreat is desired can help with these decisions, but some research participants fear that if these maps are publicly available pre-disaster, it will potentially impact on:

- property values
- ongoing costs—such as insurance
- community cohesion.

Another planning issue is that local governments receive a multitude of building and planning applications in the recovery phase because of the need for rebuilding or repairing homes. These applications may not be met adequately by existing staff resources. This overload of applications can lead to longer processing times, which impede recovery processes and lead to frustration.

Thus support for local governments and streamlined and adapted processes are needed, and do already happen in some states. For example, the Victorian state government provides planning support to impacted councils. This additional support is also needed in relation to regulations for temporary homes.

Coordination between tiers of government

Finally, integration and coordination not only need to occur between disaster management, housing policy and settlement planning, but also between different tiers of government.

A vital question is whether certain activities of disaster management would be best placed at certain levels of government. Generally, local governments do know their communities best and are therefore well-placed to work with them in all phases of disaster management.

However, local governments are resource-constrained, and tasks like risk assessment might be better undertaken at the state level to ensure a consistent approach—especially when state governments generally have more resources and capacity to undertake these tasks.

Similarly, the federal government would be in the best position to lead or coordinate decisions about which data assumptions should be used to standardise risk assessment across Australia and support data sharing and availability.

2.3 Future potential for coordination and integration

While integration and coordination between housing policy, settlement planning and disaster management have improved in recent years, there are still many opportunities for improving that integration and strengthening the role of housing and planning in disaster management (Kroen, Barnes et al. 2025).

On a broad level, integration will be improved by:

- establishing clear policy and planning responsibilities
- clarifying political priorities
- taking a whole-of-government approach.

This section describes the potential for coordination and integration, and highlights policy development options.

Improved exchange between housing, planning and disaster management agencies

Establishing increased exchange between housing, planning and disaster agencies can support the retainment of institutional knowledge, and provide a better understanding of the differing objectives and work cultures—which would lead to improved opportunities for coordination and development of joint strategies.

Such exchanges can happen through secondments and working groups of officers at lower management levels. Multi-disciplinary teams within agencies can also support a better exchange between the different fields—for example, exchange of knowledge and understanding of the planning system, housing system or emergency management.

Exchanges could be organised through the agencies themselves—particularly through the emergency and disaster agencies as coordinating agencies. Supporting better understanding and coordination can also include capability building, such as building technical skills for risk assessment.

Clearer assignment of responsibilities

A clearer assignment of housing and planning agencies' responsibilities in the different disaster phases would also support coordination. Clear responsibilities assist coordination and implementation, as:

- other agencies know who is responsible for a certain task
- the responsible agency can develop clear strategies for that task.

This is not to take away from the shared responsibilities and multi-level governance that is part of disaster resilience thinking (United Nations Office for Disaster Risk Reduction [UNISDR] 2015), as shared responsibilities also need a clear understanding of who does what, and who is leading which tasks.

The development of clear policy priorities and frameworks will assist with integrating disaster and risk approaches into housing and planning. Also, the development of clear records of the development of frameworks and strategies could reduce the reliance on individual knowledge that may be lost when staff move on.

An example of the advantage of clear responsibilities is the responsibility for housing in disaster recovery. If responsibilities for emergency accommodation and temporary accommodation are clearly defined—as is currently the case in New South Wales—then it would be easier to improve coordination between those phases, which can support households toward their recovery. This includes improved data sharing as well as clear lines of communication. Currently, unclear or changing responsibilities for temporary housing make this cooperation challenging in Victoria and Western Australia, which was highlighted by our interviewees and panellists.

Stronger consideration of disaster risk reduction in housing policy

Housing policy and housing strategies need to consider disaster risk more directly and explicitly. In light of the escalating impacts of climate change, it is imperative that future iterations of federal, state and territory housing policies and strategies proactively address the challenges caused by these impacts.

There are two major steps toward these pivotal strategies.

1. Conduct thorough risk assessments for housing developments to accurately identify areas susceptible to climate-related hazards.
2. Prioritise climate-resilient locations and strategically site social housing in regions that are less prone to flooding and other climate-related disasters.

These steps will improve the contribution of housing policy to disaster risk reduction and preparedness. However, there are provisos. For example, if community housing providers move out of a region completely, this could become an equity issue as fewer affordable housing options will be provided. Furthermore, the location of private housing will also need to be assessed, which is the task of settlement planning.

Clearer priority setting for planning decisions

For planning, clearer policy positions and specific regulations about priority criteria for urban development decisions in relation to disaster risk can assist in informing decisions about:

- where not to build
- where to retreat.

For example, clearer political priorities could include:

- adding the protection of lives and mitigation and adaptation to climate change impacts into planning regulations, as has been done in Victoria in relation to bushfire planning
- adding natural hazards more clearly in the planning system, as is planned in Western Australia.

Such priorities would strengthen the role of planning in disaster management, and assist in bringing the differing work cultures of disaster management and settlement planning closer together.

However, such an approach needs to be supported by planners having a good understanding of the risks, which needs good data availability and the capability to understand the data (which is discussed in Chapter 4).

Development of managed retreat and buyback policies and programs

The development of strategies, policies and programs for managed retreat and buyback can support disaster risk reduction and speedy deployment post-disaster based on agreed parameters. Such strategies can include:

- developing a database of suitable resettlement land
- developing risk maps to identify land that is 'due for retreat'.

While every disaster and every high-risk area is different, a general framework could be developed for buyback schemes. Currently, Victoria and Western Australia have used buyback schemes on an ad-hoc basis and only for individual disasters. New South Wales and Queensland have committed to the Resilient Homes Fund, which provides funding for buying back homes that are at risk of severe and frequent flooding, among other things. However, stakeholders in New South Wales also reported on delays in buyback offers and finding suitable land for relocation, so there is still room for improvement.

Hazard-oriented planning policy, land use plans and referral agencies

To improve the integration between settlement planning and disaster management agencies, requirements could be introduced for developing comprehensive strategic hazard-risk land use plans (at the local to regional levels), as well as for a hazard-oriented planning policy developed by hazard agencies.

The hazard-risk land-use plans could include decisions about:

- exclusions of areas for urban development
- for specific land use zonings.

The plans would need to be updated regularly according to new climate change and hazard risk predictions. The Disaster Adaptation Plans (DAPs) that are under development in New South Wales at the time of writing (2025) are an example of this type of thinking. The hazard-oriented planning policy would be developed by hazard agencies with a focus on their objectives, which could then be considered in the development of land use plans. This would ensure consistent feedback from hazard agencies in their comments on planning proposals.

At a more local level, place-based strategies in relation to urban form to manage risk in settlements could be developed by local government planners as part of a resilience program—particularly in settlements that are at high risk. This can include more compact urban development to limit settlement extension into risk areas. Integration of settlement planning and disaster management could be further supported by establishing referral directives for all natural hazards—similar to the fire agencies acting as referral agencies—as this will support regulated inclusion of hazard agencies to provide expert advice.

Streamlined planning processes and risk assessments post-disaster

In recovery, there is a need for more flexible planning requirements for the provision of temporary housing, and potentially rebuilding, as well as for streamlined risk assessment, as this would support quicker rebuilding and relocation processes. This includes streamlined planning processes and changed timelines for those processes. For example, exemptions can be granted:

- for the duration of temporary caravans on properties
- for bushfire assessments for temporary housing.

However, overall assessments and building requirements should not be weakened, as these requirements ensure the safety of residents and support other relevant policy priorities. Also, assessments of whether rebuilding is feasible or whether relocation will be recommended need to be streamlined in order to speed up decisions about temporary housing and rebuilding. This can include the preparation of state maps of areas where managed retreat is desirable, which can be drawn upon in the recovery phase.

Evaluation of recovery programs and experiences for housing and planning

Further potential for improved coordination lies in the establishment of regular arrangements for evaluating recovery experiences with a focus on planning and housing decisions. Evaluation of experiences in previous disasters will support further improvements and streamlined processes. Findings demonstrate that this already occurs to some extent through formal statutory inquiries into disasters.

However, a standardised evaluation of experiences undertaken in the housing or planning agencies will provide more focussed insights. Learnings could include whether:

- additional activities are necessary
- activities need to be improved
- further coordination with other agencies is necessary.

For example, a list of suitable temporary housing types and their availability in the state as a basis for the recovery phase could be developed, including:

- speed and ease of deployment
- suitability
- feedback from community.

To evaluate best practice and suitable options for considering cultural and demographic contexts, community service providers could be included, in addition to the impacted community. To ensure efficiency, a framework for reviews can be developed so that:

- evaluations respond to the same questions
- evaluation can be undertaken quickly without a long preparation phase.

Such a framework could be organised by the states or at the federal level.

Supporting impacted households in their decisions

The role of housing agencies and settlement planning in supporting impacted households in their decisions is limited—but it is central to give households relevant information that is easy to understand. This can include information on:

- building requirements
- buyback schemes
- resettlement opportunities through land swap (if land swaps will be offered).

Two potential options for providing information to households were mentioned in the participant interviews.

1. *Roadshows and one-stop community information hubs.* These are information events or, in the case of the hub, a central point of contact where different relevant stakeholders clarify questions of impacted households, businesses, etc. These stakeholders could include insurance companies, emergency management agencies, and Master Builders, and could include planning departments where relevant.
2. *Support case workers of impacted households in giving advice.* These workers are often the most regular points of contact, and a trust relationship is built so that households actually ask them for advice. This support could occur through a brief program to give caseworkers a general understanding of:
    - options available to households
    - red flags regarding offers from insurance or building companies
    - where further neutral information is available.

Additionally, flyers with relevant information and contact points can be developed, which caseworkers can hand out to households. However, caseworkers generally only work with households that qualify for support from government, and have applied for it. So it is necessary to think about how to reach and support other households in their decision-making—especially from the perspectives of preparedness and risk reduction.

Support of identified priorities through funding

As mentioned, the development of clear political priorities and frameworks will assist in integrating disaster and risk thinking into housing and planning.

However, priorities also need to be supported by funding. For example, buyback schemes, land swaps and the establishment of a stock of temporary housing options require funding support. Funding for disaster risk reduction efforts is especially needed—and will be cost-efficient in the long term, as it avoids larger costs for response and recovery due to a lower impact of natural hazards. This may require rethinking department and agency funding 'silos'.

Responsibilities of different tiers of government

When considering the three tiers of government in Australia, organising responsibilities between them more coherently will improve implementation and avoid duplication. Thus, responsibilities should be clarified further. This field is in a state of flux, as improvements are continuously made based on experiences with:

- disaster response and recovery
- political priorities
- changes in hazard and disaster risks.

With the current knowledge of responsibilities related to the integration and coordination between housing policy, settlement planning and disaster management, relevant tasks at each level of government include:

- *Federal government* could lead or coordinate decisions about which data assumptions should be used to standardise risk assessment across Australia and support data sharing and availability.
- *State and territory governments* could:
    - lead studies and modelling for risk assessment, such as flood studies and bushfire modelling, to standardise risk assessments
    - undertake evaluations of disaster prevention, preparedness, response and recovery when a disaster has happened
    - engage communities and local government into decisions about risk assessment and the need for certain regulations
    - prepare policies for disaster recovery situations—such as streamlined planning processes and exemptions of certain regulations
    - support local government in their response to disasters—for example, through assisting the intake of additional planning staff after disaster.
- *Local governments* could localise practice through:
    - implementing the risk assessment into planning schemes in a timely manner
    - improving coordination between local emergency management and planning
    - developing comprehensive strategic hazard-risk land use plans
    - making sure local knowledge and expertise is integrated into disaster recovery—for example, in relation to relocation and identification of suitable land.

Additionally, establishing support for local government from higher levels will assist local councils in accomplishing their necessary tasks.

Concluding remarks

The need for and feasibility of implementation of the identified options and actions will depend on the existing governance structures in the different states and territories. The policy options presented give a broad overview of what needs to be done—and could be done—to improve coordination and integration of housing policy, planning and disaster management.

However, the overview does not point towards specific steps that need to be taken in specific jurisdictions, as these would differ. Furthermore, there will be tensions or trade-offs for many of the policy options, such as tensions between disaster risk reduction outcomes and other outcomes in land use planning, such as economic, social or environmental outcomes. Thus, developing clear political priorities is central.

A final observation is that housing and settlement planning sectors often aim for integration within their own spheres but scholarship in these areas—which is already underdeveloped in relation to disaster management—offers limited engagement with wider policy integration literature. That literature in turn is somewhat disparate in terms of policy focus across:

- social services (Konrad 1996)
- health delivery, and
- public sector organisations (Löfström 2010)—see for example Konrad (1996).

There is further research and policy opportunity for cross-disciplinary scholarly engagement to better theorise and conceptualise integration and coordination in this domain (see for example Trein, Fischer et al. 2023). That research would enhance both the research literature and the development of policy across housing, settlement planning, and disaster management (Forino, von Meding et al. 2017). Such efforts were not a specific focus of this study, which preferenced attention to the empirical conditions of Australian policy frameworks and practice. However, there remains an opportunity for scholars to further pursue such a vein of inquiry.

3. Coordinating housing recovery policy and practice for improving community resilience to future disasters

- **There is a range of post-disaster housing responses. They include temporary accommodation, such as RVs, shelter, hotels, moving away, and returning to dangerous housing. Each response causes inconvenience and frustration to those affected.**
- **Efforts from governments ought to strive to use recovery funds as investments—for example, prioritising local accommodation options to support local economies.**
- **Temporary housing villages are expensive and risk wasting money. They should be utilised as a last resort, with a post-occupancy usage plan identified at inception.**
- **Decision-making in PPRR needs to be as local as possible. To support this, LGA mandates and support should be strengthened, i.e. add a fourth 'R' for resilience to core LGA functions of 'roads, rates and rubbish'.**
- **Home insurance premiums are unaffordable for increasing numbers of people, and need rethinking for long-term affordability.**
- **Buyback schemes need to be transparent, fair and effective to avoid doing harm to communities.**

3.1 Existing research

Existing research reaffirms that post-disaster housing recovery is complex, expensive and takes time. It involves a wide range of actors, including:

- all levels of government
- private sector—such as insurance organisations and various trades
- community service organisations
- other community members.

Azmeri, Mutiawati et al. (2017) note that issues that improve post-disaster recovery outcomes include:

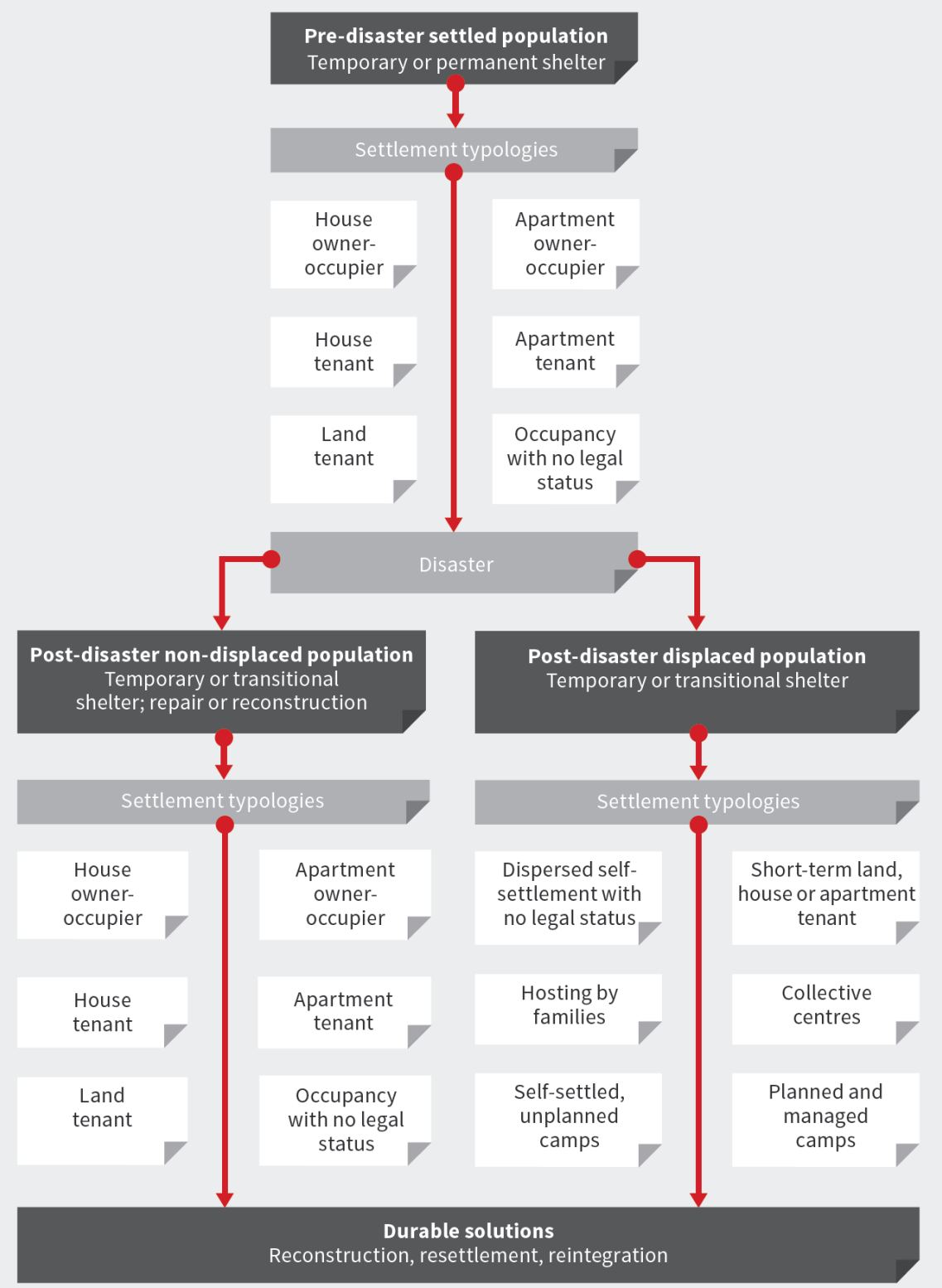
- community engagement in decision-making
- funding
- availability of builders and other associated trades
- effective government policies aimed at long-term recovery.

Irajifar, Alizadeh et al. (2015) highlight the need to identify and address factors that make communities and households vulnerable to disaster threats—for example, housing maintenance concerning bushfires and location for bushfire and flood risk. There is also a range of post-disaster temporary housing options, including:

- purpose-built temporary shelters (such as pods)
- homestays with family and friends
- use of hotels, camping parks and motels, caravans and RVs
- staying in partially damaged homes—which some households with little choice may do
- squatting in vacant housing—as happened after the 2022 Lismore floods
- provision of grants to enable people to make choices.

Figure 2 summarises some of the options that are commonly used.

Figure 2: Pre- and post-disaster housing options



Source: International Federation of Red Cross and Red Crescent Societies (IFRC) and Swiss Resource Centre and Consultancies for Development (SKAT) (2012).

Temporary housing—often referred to as 'temporary shelter' in international humanitarian response to disasters in low-income and middle-income countries—usually entails the provision of shelter kits. These kits provide the components of a rudimentary shelter made of tarpaulin, posts, nails and wire, as well as basic building tools such as a saw (Global Shelter Cluster, 2022). More permanent housing includes a range of approaches from engineers, architects and others, such as Ikea shelters.

However, the issue is one of cost, transportation and need. A key lesson in the humanitarian literature concerns the cost of temporary housing—and that once built, it is rarely temporary (Sanderson, Sharma et al. 2014). 'Temporary shelter' is considered a valuable asset, and shelters are lived in for years, or repurposed. The relevance for Australia is to:

- consider the high costs of temporary housing villages
- realise that temporary housing villages could be long-term community asset investments, and not just expensive temporary measures.

A critical issue in the literature, which is reflected in Australian disaster recovery policy, is the importance of communities being central to decision-making that affects them (Global Shelter Cluster 2018). As Gibbs, Gallagher et al. (2021: 4) note, community-centred recovery is 'regarded as the optimal approach to sustainable disaster recovery, fostering self-reliance and self-determination'.

Area-based approaches (ABAs) are a tried and tested approach to post-disaster recovery that focus on a location and actively engage communities in decisions. While engagement takes more time than, say, direct provision of housing, the process is widely considered to lead to better outcomes (Sanderson 2017). A similar approach of prioritising community consultation can be seen in the work of Living Lab Northern Rivers,[1] which has been active in supporting community-centred housing recovery in Lismore following the 2022 floods. Regarding bushfire recovery and preparedness, a community-centred approach developed in New South Wales by the Resilient Towns Initiative, funded by Regional NSW, has been adopted by the NSW Reconstruction Authority. It involves working with local government authorities (LGAs) and communities, using large-scale maps that depict the location of properties and infrastructure.

Rahmayati (2016) underscores the need to recognise diversity in communities, which are rarely homogeneous. Those living 'off the grid' may actively shun support, while others living in remote areas may live in dwellings that are not insured, due to costs or because the buildings do not have the necessary planning permission. Aboriginal communities have a unique set of needs and priorities related to land. In 2022, the residents of Cabbage Tree Island in New South Wales were affected by floods with an initial court ruling that they were not allowed to return to their land. At the time of writing (2025), this judgement has been overturned, allowing residents to return.[2]

Regarding the use of local assets in recovery, Biswas (2019) notes that using facilities that exist locally provides a range of options for decision-makers. For instance, caravans and camping parks have been put to good use after the bushfires. However, they may be less effective in flood situations as many holiday parks are located alongside rivers and inlets, which may flood.

Maly, Vahanvati et al. (2022) identify engaging with insurance companies in partnerships. The US Government's National Flood Insurance Program (NFIP) provides insurance for households who cannot afford private policies, and underwrites insurers against overwhelming claims (Feather 2021). After the 2011 earthquakes in Canterbury, New Zealand, partnerships between governments and insurance companies were found to be effective in speeding up recovery. The New Zealand Government's Earthquake Commission provided 40 per cent of the funding for property damage and recovery, while private insurers provided 30 per cent (He, Dominey-Howes et al. 2021).

1 https://www.llnr.com.au/
2 https://www.echo.net.au/2024/10/residents-to-return-to-cabbage-tree-island/

3.2 Analysis

3.2.1 Post-disaster housing experiences

In Australia, a range of post-disaster temporary housing support approaches have been used. These include:

- temporary housing villages
- pods
- flatpack homes on private properties
- caravans and cabins at local holiday parks
- staying with family and friends
- short-stay commercial options—such as motels or hotels
- social housing
- cash-based assistance.

Accessibility and usage depend on the disaster type. For instance, holiday parks located close to rivers might be subject to flooding.

Australian states have taken different approaches to temporary housing. In Western Australia, a range of emergency and temporary housing programs has been developed by the state and federal government through the DRFA. In New South Wales, following the 2022 Northern Rivers floods, several types of temporary housing were made available by the Reconstruction Authority, including motels, hotels, short-term lets and modular housing (pods and caravans).

This section presents an abridged version of four of the seven case studies undertaken as part of the wider AHURI project. For all studies, see the AHURI report *Enhancing housing recovery policy and practice for improving community resilience to future disasters* (Heffernan, Vahanvati et al. 2025).

Victoria: 2009 Black Saturday bushfires, Kinglake temporary housing

The 2009 bushfires in Victoria resulted in 173 fatalities and the destruction of nearly 2,000 homes, with a financial loss of $4.4 billion (VBRRA 2009a). The small town of Kinglake was severely impacted, which resulted in 106 fatalities and 1,397 dwellings destroyed (Murrindindi Shire Council 2009).

A community-driven strategy facilitated house recovery after the 2009 Victorian fires, orchestrated by the Victorian Bushfire Reconstruction and Recovery Authority (VBRRA). The response was organised into four themes:

- individuals
- structures
- economy
- environment (VBRRA 2009a).

The VBRRA promoted the formation of 33 voluntary Community Recovery Committees (CRCs) as an integral component of a deliberative process aimed at achieving favourable and sustainable results. The VBRRA engaged with and assisted all impacted parties over a two-month duration, offering guidance and templates for the formulation of local recovery plans. The proposals were then integrated into a state plan, financed by the federal and state governments, the Victorian Bushfire Appeal Fund and additional contributors. The Kinglake CRC was founded to supervise the region's recovery strategy.

Initially, Murrindindi Shire Council intended to establish basic infrastructure onsite (shed, toilet, motor and water tank). However, these plans were overridden by temporary villages comprising various unit types for individuals and families, shared cooking and dining facilities (except in Whittlesea), as well as bathrooms and recreational areas. A program for 'toilets and showers' was offered to individuals who opted to stay on in their premises. At full capacity, 314 individuals resided in four villages, with the Department of Human Services (DHS) overseeing the tenancies and assisting inhabitants in their move to more stable permanent accommodation.

Kinglake temporary village was established in July 2009 with an intended 12-month life span, before the land was to be reverted to a paddock. The settlement plan was devised by architects pro bono. The units consisted of two bedrooms and were constructed from flatpack materials, while major private sector firms provided common kitchens.

Strengths: The majority of residents reported a favourable experience residing in temporary villages. They valued the spaciousness, privacy, hygiene, and thermal comfort of the houses, as well as their proximity to the town, and access to communal amenities such as pet enclosures, the internet, and a games room.

Challenges: Critiques of the temporary villages encompassed a range of issues:

- insufficient community consultation
- a congested settlement design in an area where residents were accustomed to half-acre plots
- the village attracting media scrutiny despite the community's need for time and space to recuperate
- apprehension among certain residents regarding the 12-month duration. (The Kinglake temporary village actually remained operational for two and a half years post-bushfires to facilitate residents' recovery efforts.)

The quality of the accommodation was a problem. Accommodation became mouldy due to significant moisture entry. This affected walls, clothing and bedding, which raised health concerns among occupants. The village's management was perceived by some as unprofessional, instilling discomfort among residents. One participant stated during an interview for this research that:

> *We believed the temporary village was established as a residence for us. However, we recognised that it was merely a component in the whole rehabilitation process. Upon reflection, it was pretty chaotic; we were unable to simply integrate and lead a modest life in a village. We were compelled to exhibit ourselves and disclose our embarrassment to all, which was detrimental. I believe it would be beneficial for that to be approached differently in the future.* (Interview participant, Victoria)

New South Wales: 2019–20 Black Summer bushfires, Snowy Valleys temporary housing

The extent of the bushfires in Australia from July 2019 to March 2020 necessitated the activation of a range of temporary housing measures. Communities encountered challenges regarding house reconstruction, financing and insurance. Government intervention was shaped by the implementation of new measures at the state, territory and federal levels—particularly the 2018 DRFA. Following the bushfires, steps were implemented to offer housing help to impacted residents, particularly in severely devastated towns such as Batlow and its vicinity.

Insurers and the state government arranged accommodation in motels and hotels, while emergency housing was coordinated by regional providers or in nearby towns, in particular Wagga Wagga. To address a deficiency in accommodation alternatives, several informal arrangements were facilitated among family and friends (Workshop February 2024). Displaced families frequently relocated between houses over the initial six months.

Several months after the fires, the Minderoo Foundation provided 2,475 pods across NSW, with Batlow receiving 11 (Martin 2020). Intended as a temporary solution, the majority of pod grantees transitioned to long-term accommodation with assistance from housing agencies. Other local housing options included local cabins. Cabins were managed by the NSW Department of Family and Community Services (Emergency Housing [DFCS]) and rented at a minimal charge via local real estate companies. As one participant noted during an interview:

> *What's in your area is pretty important. As far as our experience here, we worked pretty closely with the community to try and get people into caravan parks and cabins. But that was only because these options were available. The cabins had only just arrived. They came just after the fires. It was lucky that they were there. [Otherwise] I don't know what we would have done.* (Interview participant)

Strengths: Cabins were identified as particularly effective, as they provided enclosed, functional and fully furnished temporary accommodation for individuals in need, while also keeping people local. The primary advantage of the pods was that they allowed inhabitants to remain within the community and maintain connections to their personal networks. Staying locally also enabled residents to engage with local housing and service providers. As one participant noted in an interview:

> *I am really pleased to return to my neighbourhood. We dedicated the weekend to clearing the property, and I wish to express my gratitude to those who facilitated our return.*

The success of temporary modular housing in the Snowy Valleys was fundamentally linked to the availability of private land for the installation of prefabricated structures, such as pods.

Challenges: The first implementation of modular homes encountered limitations, including:

- logistical challenges—such as transportation to remote regions, and traversing bushfire-impacted landscapes
- regulatory hurdles—such as adherence to state land use regulations and local Council stipulations.

When the pods arrived in April 2020 other problems arose, including the necessity for individuals to operate noisy and smelly diesel generators.

Queensland: 2011 Brisbane floods

Over 75 per cent of Queensland experienced flooding from November 2010 to January 2011, encompassing extensive areas of Brisbane City and its adjacent suburbs. Approximately 30,000 residences were flooded, and more than 200,000 individuals impacted (Queensland Floods Commission of Inquiry 2012).

The Queensland Government coordinated emergency accommodation. Relief was offered in motels and hotels across the city, allowing flood-affected people to transition from evacuation centres. This was considered a feasible option because of the extensive accommodation options available throughout urban south-east Queensland. Many individuals depended on relatives and acquaintances. Non-governmental organisations and housing agencies provided assistance to homeless people.

Following the floods, a range of assistance measures was provided:

- 65,500 Personal Hardship Assistance Scheme Payments, including emergency assistance grants and loans, were provided (Queensland Reconstruction Authority 2011b: 15).
- 100 pods and caravans were acquired to establish temporary settlements, referred to in the media as 'work-camp' hubs. This approach was used (despite unfavourable perceptions at the time) to prevent individuals from becoming homeless (AAP 2011).
- Insurers actively participated in the temporary housing process for Queensland residents. In total, 56,200 claims were submitted, with estimated insured damages amounting to $2.55 billion, of which 47 per cent were resolved through repair coverage or financial disbursements (Queensland Government 2011).

Strengths: The Queensland Government acted quickly. Within days, the state government, in collaboration with NGOs and housing providers, mobilised an array of emergency and temporary housing solutions. This encompassed motels, hotels, short-term rentals, social and community housing, pods and caravans. Funding from the state government and federal government, provided through the National Disaster Risk Reduction Arrangements (NDRRA), also contributed to enhancing individuals' capacities. Funds were utilised proactively to finance rental bond payments, enhance individuals' rental histories through community housing access, and facilitate entry into social housing.

Challenges: Many households were uninsured or underinsured, which resulted in increased need for assistance from governmental and non-governmental groups. There were also complaints of policyholder uncertainty regarding coverage for storms and floods. Flood coverage was occasionally denied based on the source of the flooding—for example, river, rainfall or storm surge. Many people assumed they were automatically insured against all forms of flooding, strong storms and other natural catastrophes, only to discover that they lacked the requisite insurance coverage (Queensland Government 2011: 3).

Also, several months post-disaster, a segment of pod beneficiaries was called to facilitate rental payments for their temporary accommodation, which was an agreement many were unaware they had consented to during the expedited home search following the floods (Mariner 2011).

Western Australia: 2021 Cyclone Seroja, Kalbarri and Northam Temporary Housing Initiative

Ex-Tropical Cyclone Seroja impacted more than 40 localities, many of them remote. Upwards of 70 per cent of structures were damaged or destroyed. The Western Australian Department of Communities (WADC) coordinated emergency housing and allocated grants (WA Department of Fire and Emergency Services [DFES] 2023). Emergency shelter alternatives were offered, mainly in regional centres such as Geraldton. Individuals and families who provided free accommodation to those affected by the cyclone were granted a 50kL water usage allowance (Morawa Council 2021).

Temporary modular housing was supplied. This was considered important because of the remoteness of locations and the consequent time that would be taken for house rebuilding, due to a critical shortage of skilled labour and materials. Temporary housing was financed through DRFA, utilising shared funds from the federal and state governments. The Western Australian Government acquired 11 converted caravans for displaced homes in and around Northampton. The mining sector contributed modular housing for 100 individuals to house tradesmen travelling to the area for housing repairs and reconstruction.

Strengths: Despite the remoteness of some locations, caravans and other temporary housing were provided. Private sector engagement was valuable, as was the development of programs such as the Temporary Accommodation for Workers Program, designed to mitigate the outmigration of skilled labour. The program comprised 30 two-bedroom homes in Kalbarri and the use of caravans (Mitchell 2021).

Challenges: The limitations on temporary moveable housing have faced criticism, especially concerning modifications implemented in other states after recent disasters. As one key informant noted:

> *There's recognition here of what's been successful in the eastern states, in terms of amending legislation to allow people to have temporary dwellings on their land for longer periods. Here, it's three to six months. Anything longer requires ministerial exemption, and that's common nationally, but it's been changed elsewhere. We saw that, after Seroja, legislation was restrictive for people who wanted to put pods or caravans on their land.* (Interview participant)

Obtaining recovery funds through the DRFA was also slow. As another key informant noted:

> *There was about $100m available for recovery after Seroja across state and federal funding. Up to 18 months afterwards, only a fraction had been allocated because the conditions that had to be met to use any of that money [were] just crazy.* (Interview participant)

A further challenge was perceived bureaucratic impediments that hindered private sector support. As one governmental key informant stated:

> *I had [private sector organisations] on the phone saying, 'Mate, just tell us which site you need the temporary accommodation developed. We'll put it on trucks and take it up there.' They just needed a bit of financial assistance from government to make it work. There were all these processes. Eventually they lost interest.*

3.2.2 Community perceptions of post-disaster housing recovery

As discussed above, community-centred disaster recovery is considered the 'gold standard'. An online survey undertaken as part of the research for this study sought to identify:

- the kinds of housing recovery assistance that were provided
- the extent to which communities in Australia perceived they were included in decisions that affected them.

Survey respondents were from New South Wales, Queensland and Victoria and included homeowners (63 per cent) and renters (27 per cent), while 10 per cent stated they had other ownership arrangements. Fifty-six per cent of respondents said their houses had suffered a lot of damage or were severely damaged by:

- bushfire: 17 per cent
- rainstorm: 10 per cent
- flood: 73 per cent.

Key findings concerning community perceptions and experiences from the survey are outlined below.

Accommodation assistance provided

Figure 3 indicates the kinds of assistance survey respondents stated they received. Thirty-three per cent stated they received no assistance, 18 per cent temporary accommodation and 18 per cent rental accommodation, while 20 per cent stayed with friends or family. Fourteen per cent stated they were provided with money for temporary accommodation.

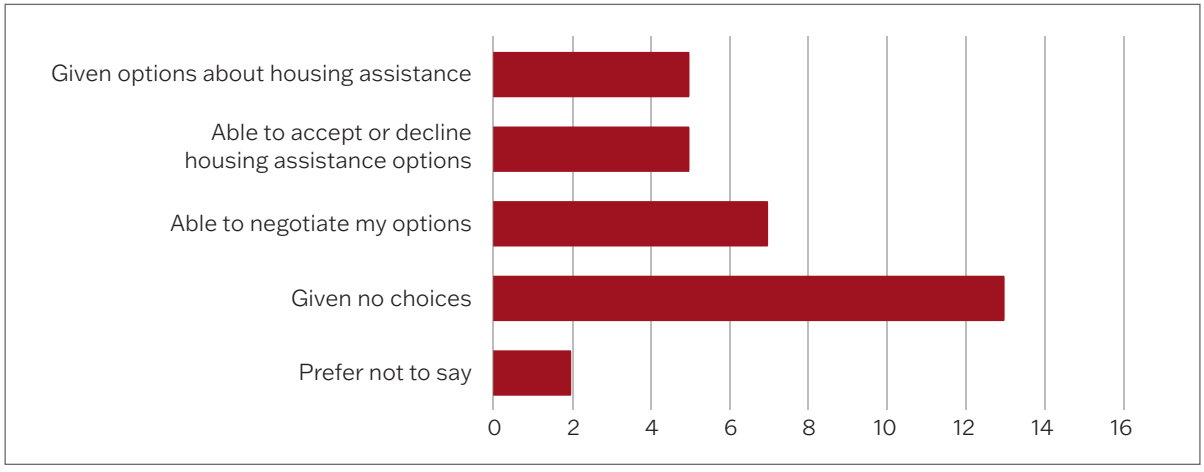
Figure 3: Accommodation assistance received after the disaster

Source: Authors. Survey question: What kind of accommodation assistance did you receive after the disaster?

Choices of assistance received

Figure 4 indicates the choices provided to households. Forty-five per cent of respondents stated they were given no choice, while 34 per cent said they were given options about housing assistance or were able to accept or decline assistance options. One respondent stated that: 'there was a pretence we were given a choice, but we really weren't'.

Figure 4: Choices given about the housing assistance received



Source: Authors. Survey question: What choices (if any) were you given about the housing assistance you received?

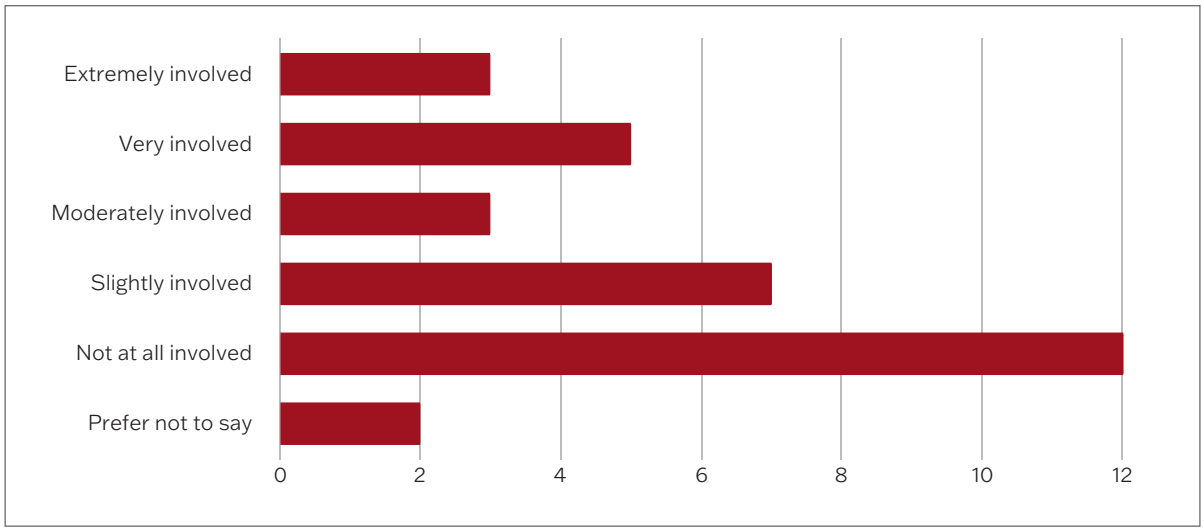
Community engagement in decision-making

Figure 5 indicates the extent to which communities were involved in decision-making. Sixty-eight per cent felt that their communities were not involved at all or minimally involved in housing recovery decisions. Respondents highlighted the negative impact on the community's wellbeing because of the absence of consultation and transparency, and described it as more distressing than the disaster itself. As one respondent stated:

> *The [Northern Rivers Reconstruction Commission] could have stopped holding sham community meetings and lying about the rules. They could have mailed or emailed information to flooded homeowners in simple language.*

Frustration over unmet expectations followed community meetings, resulting in a sense of disappointment. Anger was also highlighted. As one respondent stated: 'We were given false hope only to find out there was nothing available. There should be an inquiry into how this has been handled.'

Figure 5: Community involvement in housing recovery decisions



Source: Authors. Survey question: To what extent was your community involved in housing recovery decisions?

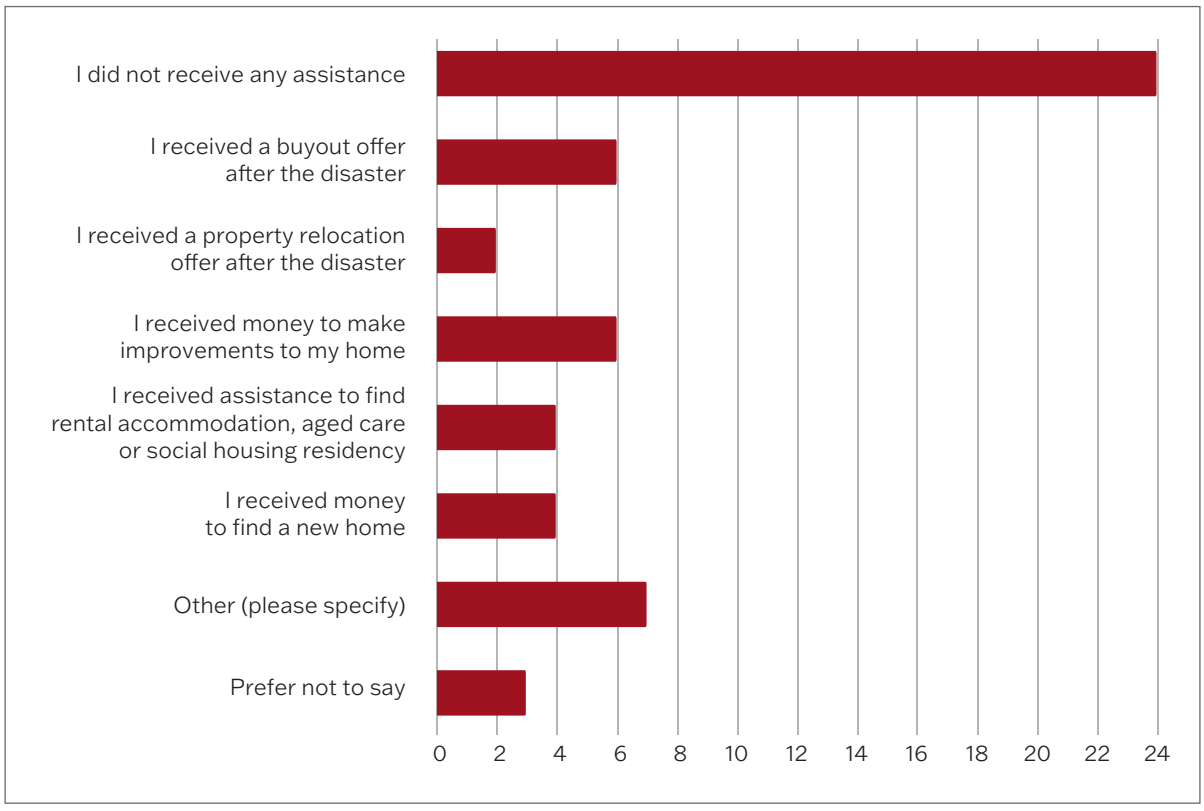
Permanent housing

Figure 6 below shows the degree to which respondents were assisted in securing permanent accommodation. Key points include:

- Sixty per cent of respondents stated they did not receive assistance towards achieving permanent housing;
- Eighty-eight per cent of renters of renters stated they did not receive assistance concerning permanent housing;
- A number of respondents were living in flood-damaged homes. One stated, We had no choice but to return to our flood-damaged home. My partner needed major surgery last July. We still have no kitchen or proper bathroom. No furniture. No fences.
- 20% of those who completed the survey received offers for buyouts. However, not all were successful. As one respondent stated:

> *We were initially told we would get a buyback. Late June 2023 we were [then] told, 'No.' [It's] disgusting how this has unfolded. The government would rather send money overseas and look good than help their own.*

Figure 6: Assistance received to help people live in permanent housing

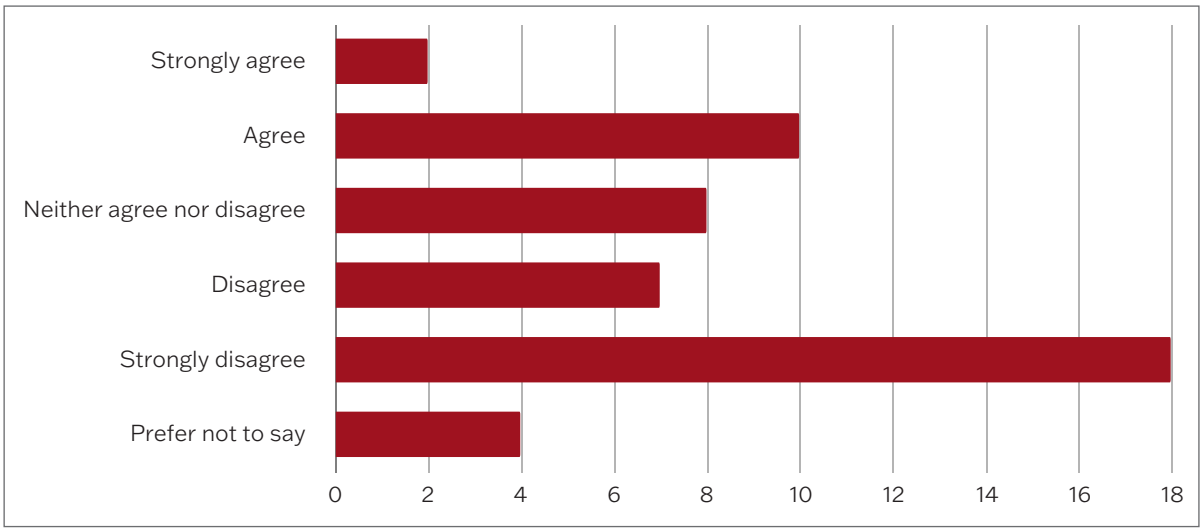


Source: Authors. Survey question: What sort of assistance have you received (if any) to help you live in permanent housing?

Feeling safer for future disasters

Figure 7 shows how safe respondents feel regarding future disaster events. Most (72%) stated they did not feel any safer should a future disaster strike. Asked what could be done differently to allow for greater inclusion, respondents emphasised the importance of greater community involvement in housing recovery.

Figure 7: Feeling of safety about threat of future hazards



Source: Authors. Survey question: To what extent do you agree or disagree with the following statement? I feel safer to the threat of future hazards based on my experience of housing recovery.

Improving disaster housing recovery in future disasters

Respondents were asked how recovery organisations could improve their responses for the next disaster. Responses included the following:

- Collaborate with local community groups to prioritise understanding and supporting the needs of affected community members
- Consider disaster-resilient methods to improve resilience against future disasters, rather than reconstructing identical structures
- Provide personalised options and a responsive policy framework to avoid delays in disaster recovery
- Provide clear, thorough information on available aid and services
- Maintain transparency and punctuality in buyback processes
- Use empathetic and helpful communication instead of top-down orders
- Create a local one-stop shop for building information and introduce mobile advisors
- Standardise insurance providers' coverages for easier comparison and comprehension
- Address the loneliness caused by interstate relocation
- Increase access to housing options, including holiday parks, caravans and temporary housing
- Accelerate rental identification, and offer bond and rent subsidies.

3.2.3 Insurance

Insurance disbursements following disasters have significantly risen in recent years. In the summer of 2019–20, Australian insurers disbursed $5.47 billion across more than 300,000 claims associated with bushfires, floods and hailstorms (Climate Valuation 2022). In 2022, Australia recorded almost 302,000 disaster-related claims, resulting in insurance damages of $7.28 billion. The figure amounted to $1.6 billion in 2023 (ICA 2023).

Underinsurance poses a significant challenge to the Australian housing sector. This situation is expected to worsen as floods and bushfires become more severe and frequent. It will result in home insurance premiums that are:

- unaffordable for many
- entirely withdrawn in the most vulnerable areas.

A rising proportion of homeowners lack insurance or possess insufficient coverage, which intensifies the demand on governments and the wider community for financial assistance following disasters. Of the residential houses burnt by the 2009 Victorian Black Saturday bushfires, approximately:

- 13 per cent were uninsured
- 80 per cent were underinsured (VBRRA 2009a; Latham, McCourt et al. 2010).

Recently, almost 60 per cent of residences impacted by the October 2022 floods in Rochester, Victoria, were either underinsured or completely uninsured (VCOSS 2024).

Factors beyond cost that influence insurance decisions include:

- a deficiency of transparent hazard information to assess an individual's risk
- insurance terms and conditions (along with exclusions) that were not comprehensively understood by policyholders, which resulted in some being uninsured or underinsured
- insufficient comprehension of the actual expenses involved in reconstructing property, attributed to escalating prices and elevated costs of labour resulting from the scale and demand of disaster recovery.

Dependence on a market-oriented strategy may exacerbate socioeconomic polarisation, as disadvantaged households frequently reside in the most hazardous regions and, owing to the elevated (and escalating) insurance premiums, are the most prone to being underinsured. This is demonstrated by numerous recent disasters that have affected regions where housing availability and cost were already problematic. As a senior management key informant from the New South Wales Northern Rivers region remarked: 'the floods contributed to the housing disaster'.

Varied hazard experiences may also be a contributing factor. Participants in bushfire claims in New South Wales and Victoria deemed the process uncomplicated, with prompt and efficient payments. In New South Wales, Legal Aid NSW effectively negotiated with prominent insurance companies to eliminate the requirement for an itemised list of lost contents. Interviews with community leaders regarding the 2009 Black Saturday bushfires indicated that the impacted communities were largely content with the insurance companies' responses and the promptness of payouts. Within 100 days of the disaster, 98 per cent of claims for residential property damage and 99 per cent of claims for commercial property loss were finalised (VBRRA 2009b). Unfortunately, this was not the experience of Northern Rivers flood victims, as the process was more complex. The process was frequently characterised as excessively protracted, and devoid of openness and clear communication, which exacerbated the physical, mental and emotional strain on already traumatised people.

The Productivity Commission (2014) identified a role for insurers in educating homeowners about the risks associated with disasters and the expenses of reconstruction. Enhancing education regarding insurance can benefit these areas by augmenting insurance enrolment and disaster readiness. Interviews with the insurance sector indicate that certain residents are disinterested in financial items. As one insurance expert stated: 'Information is readily available. However, based on my experience, individuals do not believe it will ever affect them … When it occurs, it feels as though, "I was unaware"' (Insurance industry interviewee).

3.2.4 Localising power and decision-making

A primary challenge and opportunity for more effective housing recovery after disasters, as well as for pre-disaster preparedness and mitigation, is to decentralise power and decision-making. A wide-ranging 2024 literature review on post-disaster temporary housing found that, in the USA, *'the ideal framework for response and recovery is one that is nationally financed, state administered and locally executed'* (Charlesworth and Fien 2024: 3).

This is also accepted and acknowledged in policies at both the state and federal levels in Australia. Nevertheless, the truth is that local organisations such as LGAs and community-based organisations are almost always overwhelmed and under-resourced. This is attributable to several factors, not least a pervasive top-down command-and-control culture in disaster management.

Although a control culture is vital during and immediately after a disaster—such as in professional decisions regarding evacuation timing—the continuation of a command-and-control mentality by centralised state and federal disaster management agencies during recovery can result in:

- inefficiencies
- budgetary waste
- misaligned priorities
- a detrimental sense of tokenism in community engagement.

This is a global systemic issue in disaster response, as well as in Australia.

Charlesworth and Fien (2024: 7) identify eight categories of good practice in disaster housing recovery:

1. Community engagement and participation
2. Comfort and privacy
3. Location
4. Health
5. Safety
6. Cultural and special needs
7. Community and connection
8. Social and technical support services.

To attain greater success in these areas, local actions must be reinforced and endorsed by state/territory and federal authorities. This necessitates fewer top-down decisions and an increased emphasis on bottom-up decisions. Local government plays a crucial yet underappreciated role in spearheading community-focussed decisions about housing recovery, within Australia and globally.

In short, if LGAs are recognised as overseers of the three Rs—roads, rates and rubbish—then a fourth 'R' representing 'recovery' should be incorporated. Doing this for real would require long-term commitment and resources from federal and state budgets.

Numerous instances of disagreement have emerged during disaster recovery operations in Australia and globally. A five-year global survey involving around 5,000 participants revealed that responding organisations allocated little time for effective engagement with impacted communities (Anderson, Brown et al. 2012). The outrage expressed by communities and local politicians in Lismore during the 2022 floods intensified the demand for the dissolution of the state agency, Resilience NSW, which was subsequently restructured as the NSW Reconstruction Authority. Our survey found that more than two-thirds of respondents believed their communities were either not involved or only a little involved in housing recovery decisions.

Instances of state and territory government processes aimed at enhancing LGA capability and delegating responsibility do exist. However, they are minimal and inadequate. Local governments oversee flood-related property buybacks for relocation, with financing jointly supplied by the federal and state/territory governments, as specified by the NDRRA framework (Robb, Stocker et al. 2020). Following the 2019–20 bushfires in New South Wales, the then-Resilience NSW allocated funds for placing Community Resilience Officers in LGAs. Although appreciated, these roles were predominantly on two-year contracts and addressed just a portion of the demand. Grant mechanisms for utilisation by LGAs were also allocated; however, these amounts were minimal in comparison to the cash disbursed post-disaster, and several grant recipients complained of overly burdensome reporting requirements.

Increased contact with community organisations and local NGOs is necessary. Local NGOs play a crucial role in assisting individuals experiencing homelessness, residing in temporary accommodations, and living in transient housing communities. Numerous NGOs maintain a sustained presence and have cultivated connections and trust with individuals prior to the onset of a disaster. Our research indicates that pre-existing confidence in institutions is essential for homeless individuals to accept aid.

3.3 What are the policy development implications of this research?

Critical areas of policy formulation aimed at strengthening housing resilience and recovery are as follows.

Implement proactive strategies for managing the housing crisis

Recognising the escalating complexity and prevalence of climate-induced disasters, it is imperative to transcend ‘business-as-usual’ and proactively tackle housing issues in relation to disaster threats. Such approaches need to consider vulnerable populations, such as inhabitants of social and communal housing, individuals at risk of homelessness, transient workers, and marginalised communities.

Emphasise preventative strategies

Adopt stringent land planning and zoning regulations akin to those of other nations to prevent the construction of new residences in hazard-prone regions, such as floodplains, and to provide sufficient bushfire prevention measures. After all, it is much better to prevent disasters than to respond to them.

Broaden post-disaster housing solutions

Employ diverse post-disaster options, including temporary housing and existing facilities such as holiday parks, motels and hotels to bolster local businesses and deliver urgent assistance. Options should encompass onsite caravans, and assistance for constructing further modular homes, coupled with the supply of amenities. When constructed in village-style configurations, modular homes preserve community ties and spirit.

Plan for the long-term use of temporary housing villages

Temporary housing villages are expensive and take time to build. They represent a substantial investment in infrastructure that might be repurposed in many communities. If temporary housing villages are utilised, they should be in close proximity to affected communities to prevent relocation and separation. Critically, a post-occupancy plan should be designed at inception, ideally so that the sites are repurposed as community assets or used to benefit local communities.

Formulate a comprehensive set of strategies for buybacks and controlled relocation

Advocate for buybacks and managed relocation as effective mitigation options. Such advocacy needs to acknowledge the complexity and potential divisiveness of buybacks and controlled relocation, and requires equitable and transparent procedures.

Localise community-driven recovery

Centralise the function of LGAs in community mitigation and preparedness planning. This will enable them to spearhead the identification of sites for managed relocation and the establishment of temporary accommodation solutions. The federal and state/territory governments ought to assist local governments in perpetually enhancing readiness by, for example:

- compiling a list of at-risk residents
- implementing land use planning modifications informed by risk modelling.

Promote the institutionalisation of 'build back better' principles in post-disaster reconstruction

This approach could be underpinned by insurance and other structures that provide enhancements rather than simple replacements. Reconstructing dwellings with enhanced resilience and ensuring housing is safeguarded from floods and fires should be incorporated into the considerations of government and private sector entities.

Revise home insurance policies

Tackle the rising costs of home insurance premiums by investigating alternative strategies that entail increased participation from the federal and state/territory governments to improve recovery capacities. The insurance experience varies significantly across each case-study area and incident type. It is evident that without action from outside the insurance industry, insurance costs will escalate due to the rising frequency and severity of catastrophic occurrences.

Consider the implementation of a federal insurance program for individuals unable to afford rising premiums

There may be lessons to learn from programs such as the US Government's National Flood Insurance Program (NFIP)—though the NFIP has been criticised for failing to mitigate the building of new homes on floodplains, and for accruing unmanageable organisational debt (NPR 2024).

However, federal programs may serve to shift Australian communities away from relying solely on market-driven approaches to housing recovery. Consequently, the expansion of the cyclone reinsurance pool could be explored to accommodate diverse hazard categories. Under this approach, governments would be obligated to intercede and negotiate with insurance firms to guarantee that the building damage assessment is conducted independently by an emergency recovery body such as Victoria's ERV, and is recognised by the insurers.

4. Coordination of data, actors and processes for disaster risk assessment in settlement planning and housing delivery

- **While data-sharing initiatives exist, scaling is hindered by lack of agreement on the scope and use of data, and by insufficient data-sharing frameworks.**
- **Issues of data availability, accessibility and quality impact the decisions of government, industry and community actors when assessing disaster risk in the context of settlement planning and housing delivery.**
- **The complexity of the urban planning processes and related governing structures—along with the length of time required to update policies—reduces the capacity to respond to data, and to efficiently and effectively assess, manage and reduce disaster risk.**
- **Due to the lack of clear legislative requirements related to risk disclosure, insurance has become the primary vehicle for households to identify a dwelling's risk exposure to natural hazards.**
- **To move toward a more data-driven approach to decision-making related to settlement planning and urban development will require an increase in the capacity of government agencies to collect data, and to set, manage and use adequate digital tools for data sharing and decision-making.**

The increasing severity and frequency of climate-related disaster events have tested existing intervention models applied across the four stages of prevention, preparedness, response and recovery (PPRR). In particular, the outcome of recent disaster events questions:

- how natural hazard risk is assessed
- the measures implemented to reduce exposure to such risks.

The availability of disaster-related datasets and effective sharing systems and platforms plays a critical role in disaster risk assessment and prevention (Davlasheridze and Miao 2021; Sheldon and Zhan 2019; Sunarti, Gunawan et al. 2021):

- *Disaster-related datasets* provide the necessary information to comprehend the risks and vulnerabilities associated with disasters.
- *Effective sharing systems and platforms* enable efficient distribution of this vital information among different stakeholders. This ensures that datasets can be collaboratively used to inform the development and implementation of risk-reduction strategies.

Better decisions related to risk reduction require improved coordination and integration of data:

- *Coordination* refers to the strategic and collaborative efforts to ensure the consistent, efficient and effective management and use of data across government agencies. Such management promotes interoperability, data sharing and alignment (Department of Prime Minister and Cabinet 2021).
- *Integration* refers to:

> *the process of combining data from two or more sources at a unit level … Integrated data assets hold a range of data that allow complex questions to be analysed, with new insights that are not available from a single data source.* (Department of Finance 2024)

The lack of coordination and integration in data management leads to inefficiencies and missed opportunities in disaster preparedness, response and recovery. In particular, the lack of comprehensive and integrated data results in inconsistencies and gaps that limit the applicability of risk data in decision-making (Khoza, Van Niekerk et al. 2022). When combined with the absence of standardised data collection and reporting practices, this hinders the ability to conduct thorough risk assessments that are crucial for effective DRR (Rathnayake 2021; Zayid, Bakar et al. 2020). Ultimately, the inability to effectively share and manage data increases the vulnerability of communities to disasters, as agencies are less equipped to anticipate and respond to risks (Rathnayake 2021).

Significant investment has been made and policy developed, such as the Australian Data Strategy. However, Australia still has a 'fragmented and complex data ecosystem' (NEMA 2022: 39), according to the mid-interim report from NEMA on Australia's progress in implementing the Sendai Framework for Disaster Risk Reduction 2015–2030.

This chapter:

- contextualises the findings of the 2022 NEMA report
- discusses issues related to data availability, accessibility and quality in the context of settlement planning and delivery of new housing in Victoria, New South Wales and Western Australia
- examines the challenges decision-makers face when using data for natural hazard risk assessment, and identifies mitigation measures
- concludes by highlighting opportunities to address the current data issues identified by workshops with key actors in Perth, Sydney and Melbourne.

Three areas requiring intervention were identified by workshop participants:

- Developing more effective data collection and sharing practices.
- Integrating decision-supporting digital tools into the decision-making process.
- Developing robust measurement and risk communication tools and frameworks.

4.1 Policy context

Australia's disaster risk reduction policies and interventions respond to its international commitment as a signatory of the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNISDR 2015), also referred to as the Sendai Framework.

Building on the actions identified in the Hyogo Framework for Action 2005–2015 (United Nations 2005), the Sendai Framework recognises the need for the collaborative exchange of consistent, improved and reliable data and the advancement of sharing platforms and measurement tools aimed at the collection, analysis and dissemination of such data (United Nations 2015: 15). The Australian National Disaster Risk Reduction Framework (NDRR) aligns with and responds to the priorities and strategies of the Sendai Framework (Department of Home Affairs 2018b), as depicted in Table 3. The NDRR Framework acknowledges the current data limitation and the need to 'properly connect and leverage existing data, information and services that are not accessible or affordable' and to 'better understand and address key data and information gaps and overcome barriers to sharing it' (Department of Home Affairs 2018b: 12).

Despite setting policy priorities and strategies for DRR and clearly identifying the importance of data in informing decisions related to DRR, Australia has not yet developed a satisfactory data management and sharing framework. Many national and state inquiries conducted in the last 10 years—mainly as a response to the outcomes of disaster events—recommend the following for floods and bushfires.

- Better risk-based calculations, improved data quality, accessibility and standardisation across different geographical areas.
- The federal government to take a leading role as coordinator and facilitator in setting common standards and data harmonisation to facilitate the use of data in decision-making.
- Building capability in modelling, and providing better information about vulnerability and exposure risks (Bushfire and Natural Hazards CRC n.d.; NSW Government 2022; Royal Commission 2020).

Table 3: NDRR Framework (2018) and Sendai Framework (2015): alignment of priorities and strategies

Sendai Framework for Disaster Risk Reduction 2015–2030 (2015)	Australian National Disaster Risk Reduction Framework (2018)
Priority 1: Understanding disaster risk	Priority 1: Understand disaster risk
(a) To promote the collection, analysis, management and use of relevant data and practical information and ensure its dissemination, taking into account the needs of different categories of users, as appropriate (f) To promote real time access to reliable data, make use of space and in situ information, including geographic information systems (GIS), and use information and communications technology innovations to enhance measurement tools and the collection, analysis and dissemination of data	B Identify and address data, information and resource gaps and priority C Address technical barriers to data and information sharing and availability D Integrate plausible future scenarios into planning E Develop cohesive disaster risk information access and communication capabilities to deliver actionable disaster risk data and information
Priority 2: Strengthening disaster risk governance to manage disaster risk	Priority 2: Accountable decisions
(b) To adopt and implement national and local disaster risk reduction strategies and plans, across different timescales, with targets, indicators and time frames, aimed at preventing the creation of risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience	B Identify highest priority disaster risks and mitigation opportunities C Build the capability and capacity of decision-makers to actively address disaster risk in policy, program and investment decision

Source: From UNISDR (2015: 15–17) and Department of Home Affairs (2018b: 13–15).

These inquiries recognise the mutual industry and government desire for data sharing to support improved DRR decision-making. However, they also highlight that advancement in the digital capability of the system overall has not yet reached the required maturity.

Regarding data capacity and maturity, a recent independent review by the Digital Transformation Agency (DTA 2021:52) identified that, compared to other organisations, the Australian Government has fallen behind in its capacity to manage, deliver and sustain digital and information and communication technology capabilities.

Over the years, significant effort and financial resources have been spent:

- enhancing data sharing among government agencies
- enhancing data sharing between the public and private sectors
- making this data accessible to communities.

In particular, the insurance industry has increasingly assumed a leading role in these conversations around data sharing and accessibility. One of the first attempts was in 2013, when the Insurance Council of Australia started trialling the Property Resilience and Exposure Program (PREP) in NSW. This program aimed to aggregate flood hazard data collected by local governments and using it to generate the National Flood Information Database for insurers (Minano, Thistlethwaite et al. 2024).

A decade later, the conversation about regulatory burdens, and data accessibility and availability is ongoing. In late 2023, the Australian Prudential Regulation Authority (APRA) and the Australian Securities and Investments Commission (ASIC) jointly released two discussion papers to solicit feedback on their proposals for the Insurance Data Transformation (IDT) project, which aims to address data sharing (APRA and ASIC 2023).

4.2 Analysis

4.2.1 Data availability, accessibility and quality

The 2014 Deloitte report *Building an open platform for natural disaster resilience decisions* mapped data availability for disaster risk in Australia. This report identified three critical sets of data inputs required to make informed decisions when considering disasters:

1. *Foundational data*—which describes social and physical characteristics of areas of interest.
2. *Hazard data*—which defines and measures risks associated with a natural hazard.
3. *Impact data*—which quantifies damage caused by a disaster event (Deloitte Access Economics 2014).

Figure 8 provides a full definition of the different categories of data, and an overview of the data type included in each category.

We have conducted desktop analysis to update the 2014 Deloitte report on data mapping, with the aim of assessing and identifying any progress on data availability, quality and accessibility.[3] The outcome of this analysis indicates that overall progress has been slow since the Deloitte report—and many issues related to access, quality and duplication of sources remain. The following points emerged from the data review:

- Foundational data used to inform hazard modelling has improved in accessibility and standardisation. It is currently available at all government levels, within different agencies, and among private companies—although it is currently organised and presented in a disjointed manner.
- Hazard data has improved in quality, but is inconsistent. This inconsistency is linked to the way information is produced. Hazard data is modelled in response to standards and parameters established within state and local government legislation and policies—which means that the quality and consistency of the data reflect jurisdictional and institutional arrangements.[4]
- Impact data held by emergency management agencies, local government and insurance companies are, in general, not openly accessible. This is because of privacy or commercial issues. All research participants recognised the importance of accessibility to this data, which contributes to assessing exposure to natural hazards—and can therefore be used to inform effective risk-reduction strategies.

3 For detailed data mapping, refer to Perugia, Babb at al. (2025).
4 Refer to Chapter 2.

Figure 8: Foundational, hazard, and impact: definition and data type

Foundational data	
Base layers of locational information relevant to all hazards, including exposure data and fundamental geographic data. Used for a broad range of purposes, including but not limited to analysis of natural disasters. (Deliotte 2014:33)	• Land cover data • Topographic datasets • Weather datasets • Climate change datasets • Buildings spatial data • Socio-economic datasets • Water datasets
Hazard data	
Hazard-specific information the risks of different disaster types, providing contextual data about the history of events and the risk profile for Australian locations. (Deliotte 2014:33)	• Flood studies • Flood hazard maps • Bushfire prone areas maps • Bushfire attack level assessments • Cyclone hazard recurrence interval 25/500 years map • Wind region classification map
Impact data	
Data on the potential and actual impacts associated with natural disasters, including information on historical costs and damage and the current and predicted future value at risk. (Deliotte 2014:33)	• Building and infrastructure damage • Fatalities and injuries • Evacuation and displacement • Health data • Financial assistance • Reconstruction and recovery • Insurance losses • Total economic cost

Source: Authors.

The updated data mapping also shows that most available information is shared using different platforms that are not integrated. Even when an attempt is made to centralise the sharing of information, there are still challenges related to data ownership that need addressing. For example, the Australian Flood Risk Information Portal (AFRIP) was developed to provide a single national point of reference for accessing 'high-quality flood information' However, due to intellectual property (IP) issues, the information shared in the portal is not complete and cannot be considered accurate. The Geoscience Australia website, which hosts the AFRIP portal, clearly states in the opening page linking to the portal that:

> *Due to uncertainty in the ownership of the flood study information, the site can only publish details of the study and associated data, not the actual flood study. Except where ownership has been clearly established.* (Geoscience Australia 2025)

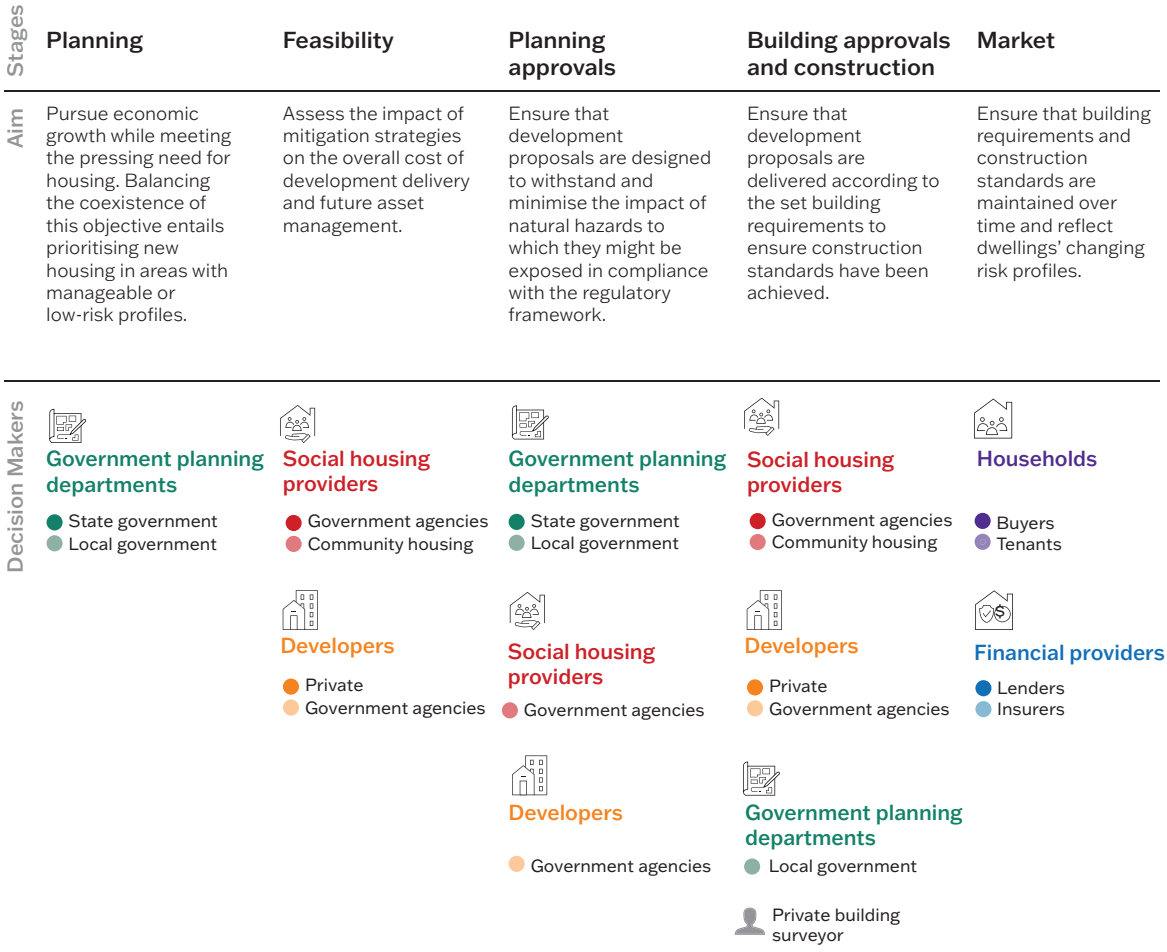
4.2.2 Settlement planning and housing delivery decision-making

As part of this research, we charted how key stakeholders currently:

- access data and information at each stage of the planning and housing delivery process
- use data and information to assess disaster risk.

This was done to identify mitigation strategies aimed at lessening the impact of natural hazards on assets and communities.

Figure 9: Planning and development process stages: overview of decision-makers

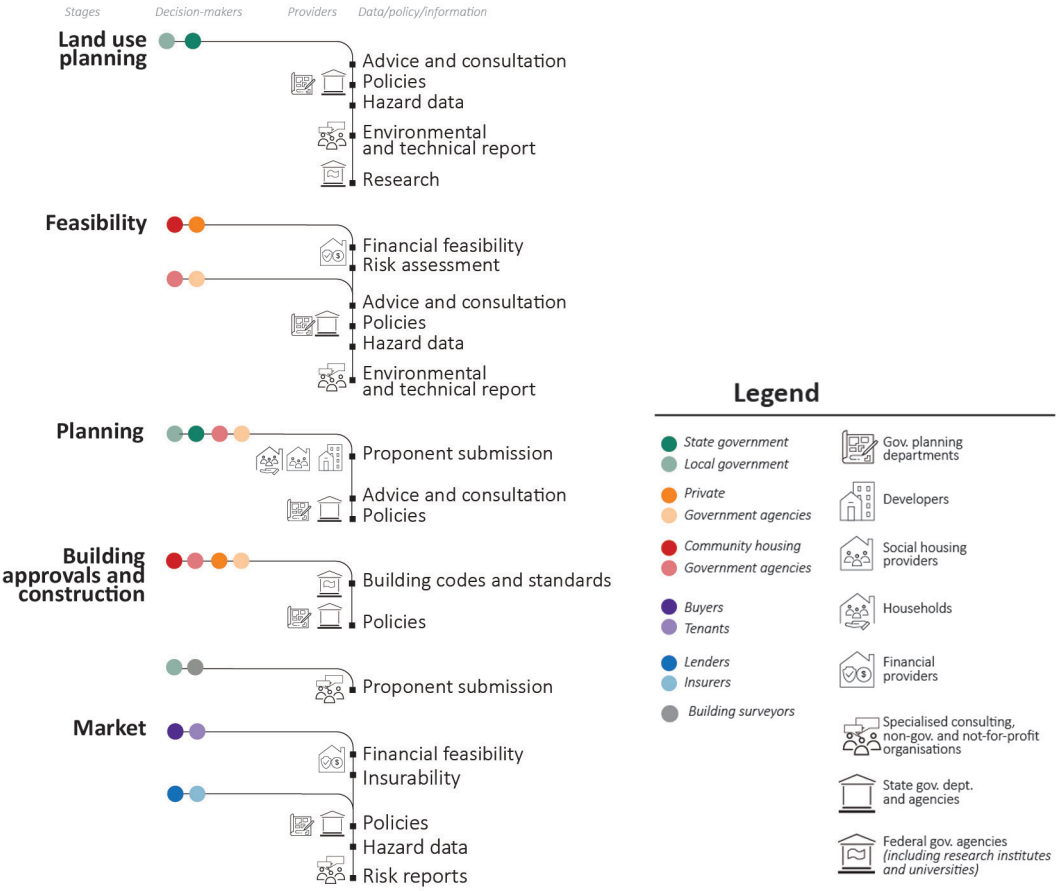


Source: Authors.

The key actors consulted to complete this mapping encompassed state and local government planning departments and authorities, public and private developers, social housing providers, and lenders and insurers. The results are summarised in Figure 9.

Figure 10 provides an overview of the relationship between these actors and the type of information they exchanged for decision-making.[5] These research participants stated that they faced several challenges in effectively using data as part of the decision-making process. In this section, we discuss these issues, drawing on the information collated in the interviews, the survey and state-based workshops conducted as part of the research.

Figure 10: Data and information exchange and access overview



Source: Authors.

Lack of technical skills to produce, interpret and use data

Overall, participants in this research identified expert and tacit knowledge as necessary in risk assessment. However, they noted an issue with the ability of government agencies to produce data, as well as the decision-makers' capacity to fully comprehend data, which then required the support of third parties to source and interpret this technical information to be able to use it in decision-making.

5 Refer to Perugia, Babb et al. (2025) for detailed mapping at each stage of the development process.

Survey respondents highlighted that while data and information to address bushfire (58%) and flood (48%) risk assessments are generally adequate in quality and quantity, these require specific technical knowledge before they can be interpreted and used to inform planning and development decision-making. This was reflected in the response recorded in the open-ended questions of the survey, where research participants expressed concern about urban planners' capacity to assess risks and interpret data.

Third parties were identified as playing an important role in data production and interpretation, as well as in the risk assessment that is part of the planning processes. This suggests that risk assessments and analysis are deferred to external consultants or licensed practitioners, as in the case of Bushfire Attack Level (BAL) assessments. A Western Australian local government planner expressed concerns about the capacity of local government planners to critically evaluate reports provided by consultants:

> *Being able to critique a BAL report in our work is essential. I have picked up many issues in reports that have come from Certified Bushfire Consultants, though not everyone has this knowledge, and that is concerning.*

On the same theme, a Tasmanian participant noted:

> *In Tasmania, the assessment of risk is largely deferred to licensed practitioners. Assessing risk is generally limited to ensuring an assessment has been undertaken by a suitably qualified person, and that the requirements of that assessment are followed through. The depth of risk assessment actually undertaken by Council officers is very low.*

Participants also pointed out a heavy reliance on referral bodies from state and local government planning departments, which was seen as impacting the planning process. A Victorian survey respondent explained:

> *There is not enough guidance for strategic planning. CFA [Country Fire Authority] as a referral authority is not equipped with the resources to be able to assist. This causes extensive delays and frustration from community members, developments and the government that projects cannot progress in a timely manner.*

Survey respondents also remarked that some local governments have a stronger capacity for data management, and these were considered the ones that do well in competitive funding schemes to access resources. A New South Wales local government planner questioned how support is allocated to overcome challenges related to the lack of skills—particularly in regional areas:

> *I work at [the] Council with very experienced flooding engineers and good flood data. Other councils, particularly in remote regional areas, do not have the same expertise and data, and would benefit from more assistance from the NSW state government.*

Inadequacy of planning governing tools and policies

The inadequacy of institutional instruments—such as zoning, standards, and building codes—in addressing disaster risk emerged as a recurring theme.

Several local government planners highlighted a lack of institutional capacity in the local government sector to adequately address risk in various areas of housing development—particularly strategic planning or planning at a larger scale. Many suggested there had been a 'systematic failure' of zoning regimes to address both bushfire and flood risk, with urban planners voicing the need to reconsider allowing residential development in certain areas.

The incapacity of policies and planning tools to adequately manage risk was linked to the lengthy process required to update policies to respond to updated data, with the bigger impact felt with regard to flood:

> *A lot of studies have not been incorporated into the planning scheme, which does not present the most up-to-date flooding mapping, and presents a certain amount of unknown risk. This is due to the complexity and time [it] takes to amend the planning scheme.*

Regarding flooding, participants noted that the merit-based approach to development approval is not appropriate in flood-risk areas. This is because 'mitigation is always an option', even when it should not be. During the interviews and the workshop, state planners also noted that changes in policies are mostly politically driven, and are often implemented as reactionary responses to disaster events. For example, the recent revision of the New South Wales planning manual and flood policy suite[6] was linked to the independent expert's inquiry on the flood events in northern New South Wales in February and March 2022.

A 2019 study by Gonzalez-Mathiesen, March et al. on changes in the planning system in relation to bushfire policies in Victoria points out that the four main areas of urban planning regulation and framework related to bushfire management risk have typically evolved following disaster events that had substantially impacted communities.

However, participants expressed concerns about the lack of equal responses in Victoria relative to flooding:

> *The application and review of bushfire risk mapping has been led by the state government since the Bushfire Royal Commission in 2009. Despite numerous floods, local government is struggling to implement flood-related planning controls due to community and political opposition. [There is a] lack of leadership and political will at the state level with regard to flood mapping. The state government should be responsible for implementing flood-risk planning controls.*

The influence of politics on issues relating to the use of data and information in assessing flood risk was also a recurring theme in survey and interview responses. Political support is essential for policies to be endorsed and approved, both at the state and local government levels.

However, participants expressed concern about the influence of the development lobby on policy and decision-making. A Western Australian survey respondent observed that in both the case of bushfires and floods, planning decisions have 'been undermined by politicians, corporate greed and ignorance'. This point was also discussed in the inquiry meeting, where panellists pointed out that councillors are called to make decisions, but they don't have the necessary competencies to fully understand the implications of their choices—especially at the local government level. The reason for this was identified as LGAs having a problem attracting properly skilled staff, including councillors, because of the low salaries offered. One panellist noted that: 'investing in long-term plans is required to tackle these issues, but there is a certain 'short-termism' in local politics'.

Overconfidence in risk mitigation

All actors involved in the delivery of housing—housing providers, private and public development organisations—rely heavily on planning frameworks and policies for their decision-making. In the feasibility stage, developers base their decision on the review of existing planning tools (or development controls) that are applied to the considered site, known as due diligence. Adherence to policies and evidence that a proposed development meets prerequisite approval is also important for accessing funding from lending institutions.

Policies at the local level, including local government schemes, were identified as 'essential' information used to make decisions about assessing and mitigating disaster risk by almost half (48.7%) of the respondents for bushfires and over two-thirds (69%) of respondents for flooding. This outcome reflects the responsibilities LGAs hold regarding land use and development approval.

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6 Amendment of the 2021 Environmental Planning and Assessment Amendment (Flood Planning) Regulation 2023 (EPA Reg Amendment) and replaced references to the Floodplain Development Manual (2005 Manual) with the new Flood Risk Management Manual (2023 Manual).

However, participants noted that policy frameworks are not strong enough to address risk effectively. They pointed out that there is a heavy reliance on mitigation measures at each stage of the development, asserting that: 'Planning systems are designed such that mitigation is always an option. There is no capacity to refuse something just because it is a bad idea'.

During the Western Australian workshop, a state planner noted that development proponents keep questioning decisions and ask for mitigation measures to be reassessed at each stage of the approval process when they advance and make a case for their development. Such a process weakens the effectiveness of the mitigation measures initially put in place at each stage of the review and iteration of the approval process.

Regarding bushfires, survey respondents pointed to 'overconfidence' in Australian Standard 3959:2018 Construction In Bushfire-prone Areas, and to a 'poor understanding of what it actually achieves, and how easily it is undermined by small flammable items around a house'. One survey respondent identified a lack of knowledge about risk in the unrealistic perceptions and expectations held by developers and homebuyers, arguing that buyers held perceptions that if codes were met and legislated procedures were followed, then the risk of bushfire would be removed. This extends to the decision authorities as well, with respondents pointing to a possible 'conflict between risk and legislation'. A survey respondent from SA noted:

> *In South Australia, this is mainly the concern of the Country Fire Service (CFS) (a referral agency), and there is an evident attitude among lawmakers that if dwellings meet Building Rules requirements in Hazard areas, this will guarantee buildings and occupants will be protected from bushfires.*

This perception was echoed by a Victorian respondent, who noted that: 'lessons from last decade have made it abundantly clear you cannot design a house that will withstand Australian bushfires'. Issues were also raised concerning building approval processes and the role of surveyors in guaranteeing that the execution of the build meets building standards.

During the Inquiry Panel, it was pointed out that there is a need to better understand the interplay of planning processes and building standards. It was suggested that further investigation is needed to identify where and how building defects and development control can be linked in the planning approval and building review process to strengthen the compliance system.

Data as a point of conflict

Data are seen as a point of conflict in decision-making processes. During the Victorian workshop, participants voiced a general lack of trust in data used for risk assessment, with one pointing out that: 'every time a disaster happens, it's a departure from the model … which challenges the credibility of the data and the model that we use to forecast'. The participant went on to explain:

> *Data is constantly being reviewed, updated and there's probably lots of people who do the modelling who aren't aware that, you know, a company over here is doing some additional modelling or data collection.* (Workshop participant, Victoria)

Another workshop participant echoed: 'There's never going to be enough data or enough high quality data.'

The quality of data used to inform decision-making is scrutinised and questioned at each stage of the decision-making process, but assumes particular relevance in two moments:

- during community engagement—as part of policy development
- in the development assessment process.

Community engagement in the process of embedding technical data in planning tools is essential to capture information that could otherwise be omitted. As a sustainability expert working in local government in regional Victoria explained:

> *[During consultation] you will pick up things like someone's built a wall, which means that this section here doesn't flood, but this [other one] floods more. But the model may not pick it up.*

It could also be a point of contention when community members' properties are directly affected by possible decisions and restrictions linked to the data, for which the community members' response is, 'You can't tell me what I can and can't do on my property'. The participant went on to explain that Council members feel pressured by communities and say, 'That's right. We can't tell people what they can and can't do on their properties: therein lies the problem and the power to make decisions.'

Technical data and information provided by proponents when submitting approval requests for development assessment constitute the basis of the merit-based risk assessment. Development assessment processes are the second point where data are contested. Representatives of planning approval authorities interviewed as part of the research highlighted the importance of the data endorsed and embedded in the legislative framework. A lack of trust in the data can become a point of contention in the development approval stage, where information provided by proponents is used to challenge planning tools, becoming *'a war at who has the best data'.* As a local government planner based in regional Victoria explained:

> *Experts come along, and I'm getting paid 10 grand, and someone getting paid 20 grand said, 'Ah no, no. This will be right. This will be fine. My modelling is better than yours.' And then the planning permit gets through.*

Participants in the Inquiry Panel meeting echoed this sentiment, linking this lack of trust in data to the current weak data-governance system, and what one panellist referred to as 'data washing'. This term was used to indicate what they addressed as 'the current data paralysis we are experiencing'. In the opinion of one Inquiry Panel member, we have currently reached a point where 'People refuse to make a decision because there will be better data available' and called for broader application of the principle of 'optimal ignorance'.

In the context of risk assessment, to overcome the current paralysis, it is required to know what is worth knowing and what is not, therefore being able to discern between the information required to make a decision and the one to avoid (irrelevant data). The Panel member explained: 'We need to accept uncertainty and learn how to make a decision around uncertainty … Insurance [companies do] it all the time.'

4.2.3 Opportunities for improved decision-making

Developing institutional capacity for better data collection and sharing practices

The issues of privacy and government data ownership remain the main hurdles to overcome on the path to better decision-making. No advancement in data-driven decision-making around disaster risk reduction in settlement planning and urban development is possible without 'putting the trust back in data' and encouraging data sharing by establishing stronger data-governance regimes. While workshop participants identified the need for a 'one-stop shop' solution to access data, such as Digital Twins, the Inquiry Panel discussion focussed on communities and issues related to personal data sharing. Management and sharing of data collected following a disaster was at the centre of the discussion during Inquiry Panel meetings.

In particular, emergency management, service providers and community leaders highlighted the negative impact poor data sharing has on communities, as the lack of a clear data-sharing framework can cause particular stress in affected households. In some cases, affected households are asked to relive trauma by having to retell their story to any new person coming in to help and needing to collect information from them. Medical record-sharing was identified as a good example of how this issue can be addressed, and should be looked at in more depth to allow the use of such a data-sharing framework in the context of disaster risk management, preparedness and recovery.

Embedding decision-supporting digital tools in the decision-making process

Information derived from modelling techniques enables decision-makers to accurately consider the consequences of their decisions on risks in future urban developments (Jenkins, Creed et al. 2023; Yabe, Rao, et al. 2022). The exchange of this information across the main actors involved in urban development processes could be enhanced through the use of decision-making tools, such as scenario-planning analysis.

Scenario tools can guide the risk assessment process by leveraging data to:

- identify high-risk areas
- predict the probable events of a disaster
- assess vulnerabilities.

Such data enables public authorities and urban planners to inform better allocation of infrastructure. As a Victorian emergency management operator pointed out in the Melbourne workshop, these tools are needed for future-proofing:

> *We need to start thinking about an alternative now, and it just changes the way that planning could potentially operate in terms of being able to think through the future of changes rather than looking at planning provisions that are often based on history.*

However, while these scenario-planning tools provide support for strategic planning and 'big-scale thinking', there is also a need to better understand how these overarching strategic directions reconcile with the decisions taken at the 'local' level. As a state planner in Victoria noted during the workshop:

> *We work at such a high level. [But] my mind goes to: What are we doing in terms of data in the context of looking at the state as a whole, where our hazards are, where the high-risk areas are, and then planning growth. But then at the granular scale, at a site scale. How do we better scale risk at the site scale?*

The smaller scale is not only about assessing and managing risk to housing but also the overall development, including infrastructure and publicly owned assets. As was pointed out during the Inquiry Panel meeting: *'It is not only about delivery [of] housing, as this comes with an infrastructure that the local government needs to maintain.'*

The investment of current state governments in digital technology data-sharing platforms, such as Digital Twins (DTs), provides an opportunity to better support and integrate data use in strategic planning and asset risk assessment. However, the lack of government digital capability and support frameworks to procure, maintain and manage these tools limits their effectiveness.

We have explored current literature to seek examples of how to better understand the organisational and governing structure changes needed to effectively embed these technologies in everyday government operations related to urban and built environment management.

However, the majority of the information located in existing academic and grey literature focusses on exploring the technical challenges associated with the use of these tools, rather than evaluating the benefits and their implementation as part of decision-making processes related to land use planning and natural hazard risk assessment. Our experience resonates with the findings of a 2023 literature review conducted by Lei, Janssen et al., which concludes that the literature (and research) is overwhelmingly concerned with addressing the technical aspect of the implementation of these emerging technologies. Lei, Janssen et al. note that more research is needed on best practices and the use of these tools, as there is a lack of understanding about how these can be fully embedded in decision-making processes (Lei, Janssen et al. 2023: 11).

Improve risk assessment and communication

Effective risk communication is based on a shared understanding of risk among all parties involved through coordination, aggregation and dissemination of information. Currently, due to the lack of clear legislative requirements related to risk disclosure, insurance has become the primary vehicle for households to identify a dwelling's risk exposure to natural hazards.

Regarding insurance, respondents to the survey called for increased transparency and sharing of information—particularly insurance data and models used by insurers to determine housing insurance costs 'to better understand and assess this component with respect to natural hazard risk' in planning processes. Improvement in data-sharing agreements with insurance companies was framed as an opportunity to reconcile the management of individual risk (household-level intervention) with shared responsibilities (planning).

Participants in this research, including those contributing to the Inquiry, overwhelmingly pointed out the need to improve this sharing process—in particular, to empower communities and individual households to make better decisions and be part of the decision-making process. During the Inquiry Panel meeting, participants said that sharing data with homeowners is key to achieving better outcomes by raising risk awareness and empowering communities to make better choices when it comes to managing their own risk.

Three actions were identified as critical to exit the current impasse and build awareness around risk and risk reduction and management:

1. Establish clear parameters to measure risk levels, particularly for flooding, building on the knowledge established in bushfires—such as the BAL system.
2. Allowing homeowners to have more control of their own data and offering them the right to 'appeal'. Inquiry Panel participants pointed out that: 'People feel labelled and left alone to manage that "label", with no way out.' This is because once the risk is assessed and the data is shared, there is no system or procedure in place to update this information.
3. Creation of mechanisms that allow the recording and managing of changes in risk levels over time. The current mechanisms used to record risk levels are static and do not allow for changes in risk levels to be considered.

4.3 Policy implications

The current housing affordability crisis highlights the pressing need to deliver more housing while simultaneously considering the escalation of natural hazards, by carefully evaluating where new housing will be located. Balancing the coexistence of these objectives entails prioritising new housing in areas with manageable or lower-risk profiles, rather than building in areas with elevated and unmanageable risks.

Risk assessment depends on:

- information accessed—such as data sources, data quality, methodologies and types of information
- who is doing the assessing—as different stakeholders prioritise distinct aspects of climate risk
- legislative requirements—as these vary according to jurisdiction, with states and local governments adopting differing frameworks, tools and criteria for assessing risks, which leads to inconsistent approaches and outcomes (Perugia, Babb et al. 2025).

While there is a shared understanding that effective data sharing is crucial for enhancing DRR and management, challenges remain that undermine coordination and integration efforts. The complexity of data sharing arises from various factors, including:

- technological, organisational and socio-political barriers
- aligning with current literature
- the challenges of cross-border and multi-agency contexts, where diverse stakeholders must navigate varying perspectives, trust issues and levels of data maturity (Adrot, Brunet et al. 2024; Jussen, Möller et al. 2024; Rahman, Islam et al. 2024; Schröter, Schweizer et al. 2024; Clark 2023).

Three main areas of intervention need to be addressed in policy to support data-driven decision-making.

1. **Strengthen the digital capabilities and maturity of government institutions and professional bodies**: To effectively implement digital technologies that support data exchange and analysis for decision-making, it is crucial that the involved government agencies reach a similar level of digital maturity. Efforts should focus on building capacity by eliminating structural barriers and introducing strategies that foster the creation and execution of new governance structures and protocols.
2. **Develop robust and transparent data-governance frameworks:** Improving disaster risk reduction and preparedness demands coordination and standardisation of data-sharing practices, along with coordination of users across government agencies and other professional sectors.
3. **Revise and create adaptable and responsive risk assessment tools and data-recording mechanisms:** Existing risk assessment methods are static and fail to account for shifts in risk levels over time, for example from interventions to improve building resilience. Systems need to be implemented that can track and manage changes in risk levels over time. This needs to be paired with legislative requirements that define how and when the risk is communicated through 'mandatory risk disclosure'. This is particularly relevant for homeowners, as it would enable them to implement strategies to manage risk and make informed decisions when purchasing their homes.

5. Policy development options

5.1 How effective is housing policy, settlement planning and disaster management integrated in Australia, and how can it be improved?

The integration of housing policy and settlement planning with prevention, preparedness, response and recovery is essential, as housing remediation is an essential element of disaster recovery, and settlement planning influences where we live and, thus, our disaster risk exposure. More effective approaches towards integration have been developed in recent years, but there is significant scope for improvement.

While state emergency management and hazard agencies have established good practice in coordinating with other agencies, the activities and knowledge of these lead agencies need to be better integrated with housing and planning agencies on a day-to-day basis. On a broad level, integration can be improved by establishing clear policy and planning responsibilities, clarifying political priorities and taking a whole-of-government approach.

Australian housing agencies are experienced in disaster preparedness, response and recovery—particularly in relation to emergency and temporary accommodation. Yet there is a need to better integrate disaster risk reduction in day-to-day thinking and policies—for example, through the consideration of climate change impacts and disaster risk in housing strategies.

Settlement planning agencies are experienced in disaster risk reduction, disaster preparedness and disaster recovery—particularly in risk assessment in relation to urban development, and supporting rebuilding. Disaster risk reduction in relation to bushfires has become strongly embedded in the last decade, but is less clearly regulated for other natural hazards. Agency coordination could be extended in the recovery phase, including policies for moving away from risk areas (managed retreat), compensation schemes (buyback), and streamlined planning processes for rebuilding.

What are the barriers to the integration between housing, settlement planning and disaster management?

Barriers to the integration of housing policy, settlement planning and disaster management include differing work cultures and objectives, which can lead to differences in risk assessment. Differences in risk assessment can also be caused by a lack of understanding or awareness of the risk by agencies that do not work in this area on a daily basis. Thus, there is a need for capability building and improved data availability and quality. Research participants reported that frequent organisational restructuring and the prolific use of fixed-term contracts were hindering coordination.

While local government is considered the most significant level for localising support to communities after disasters, and for preparing and implementing prevention and mitigation strategies, research participants agreed that a lack of resources impedes this role. For example, an absence of necessary resources often prevents local governments from responding sufficiently to community housing needs during the disaster recovery phase. This includes a backlog in the issuance of planning and building permits for dwelling repair or replacement. Local government should be acknowledged in their important role for disaster management and supported to execute this role through financial support, along with tools and frameworks for better understanding of risk and implementation.

How can integration between housing, settlement planning and disaster management be improved?

Integration of housing policy, settlement planning and disaster management can be improved through several actions, as highlighted in Chapter 2. On a broad level, establishing clear responsibilities, political priorities and a whole-of-government approach will improve integration. This includes the following.

Improved exchange between housing, planning and disaster management agencies

Increased exchange between agencies through secondments and working groups of officers could be established at lower management levels, as well as building multi-disciplinary teams within agencies, along with reciprocal capability building, such as building technical skills for risk assessment.

Clearer assignment of responsibilities

Clear responsibilities assist coordination and implementation, as other agencies know who is responsible for a certain task, and the responsible agency can develop clear strategies for their task.

Stronger consideration of disaster risk reduction in housing policy

Housing policy and housing strategies need to consider disaster risk more directly and explicitly. A crucial first step entails thorough risk assessments for housing developments to identify areas susceptible to increased hazard risk, and to then prioritise low-risk locations. This will improve the contribution of housing policy to disaster risk reduction and preparedness.

Clearer priority setting for planning decisions

Clearer policy positions and specific regulations about priority criteria for urban development decisions about disaster risk are needed to assist decisions about where not to build or where to retreat. For example, clearer political priorities could include adding the protection of lives into planning regulations, along with mitigation and adaptation to climate change impacts.

Development of managed retreat and buyback policies and programs

These policies can support disaster risk reduction and speedy deployment post-disaster, based upon agreed parameters. These can include developing a database of suitable resettlement land, and developing risk maps to identify land that is ‘due for retreat’.

Hazard-oriented planning policy, land use plans and referral agencies

Requirements for comprehensive strategic hazard-risk land-use plans can be introduced at local and regional levels. These plans could include decisions about exclusions of areas for urban development or for specific land use zonings. An example of this type of thinking is the Disaster Adaptation Plans (DAPs) under development in New South Wales. In addition, a planning policy developed by hazard agencies with a focus on their objectives could be considered in the development of land use plans. Establishment of referral directives for all natural hazards—similar to the fire agencies acting as referral agency—would further support regulated inclusion of hazard agencies to provide expert advice.

Streamlined planning processes and risk assessments post-disaster

In disaster recovery, there is a need for more flexible planning requirements for provision of temporary housing, and potentially rebuilding, as well as for streamlined risk assessment, as this would support quicker rebuilding and relocation processes.

Evaluation of recovery programs and experiences for housing and planning

Further potential for improved coordination lies in the establishment of regular arrangements for evaluating recovery experiences, with a focus on planning and housing decisions.

Responsibilities of different tiers of government

Organising the responsibilities between the three tiers of government more coherently will improve implementation and avoid duplication. For example:

- *federal government* could lead or coordinate decisions about data assumptions for risk assessment standardisation, and support data sharing and availability.
- *state and territory governments* could lead studies and modelling for risk assessment, undertake evaluations when a disaster has happened, prepare policies for disaster recovery situations, and support local government in their response to disasters.
- local government could implement the risk assessment and develop comprehensive strategic-hazard-risk land-use plans.

5.2 What are the best housing recovery approaches that meet both immediate needs and contribute to the preparedness, mitigation and prevention of future disasters?

Based on our research, policy development options that strengthen housing resilience and recovery are as follows.

5.2.1 Prioritise prevention

Acknowledging the increasing complexity and frequency of climate-fuelled disasters, there is an urgent need to move beyond business-as-usual strategies to proactively address housing challenges to prevent or reduce the increasing threat of natural hazards. There is an opportunity to learn from other comparable countries that enact strong land planning and zoning laws to avoid constructing new homes in hazard-prone areas, such as floodplains, and ensure adequate bushfire protection measures are enacted and maintained.

5.2.2 Should a disaster strike

Community-centred recovery needs to be taken more seriously

As our survey shows, responding agencies and organisations usually fall short in adequately engaging with the communities and local organisations that support them in their own recovery. (This is verified by a wealth of evidence from Australia and overseas.) All levels of government have a key role to play in this, and that may mean altering how they do business. It may mean, for example, ceding greater power to Community Recovery Committees, as they can be effective in coordinating agencies, offering guidance, creating opportunities for dialogue, and supporting communities in housing recovery challenges.

Support local economies and communities

A variety of existing formal post-disaster housing options exist, none of which are perfect and almost all of which cause frustration. Options discussed earlier include RVs, camping parks, homestays with others, hotels and motels. Responding organisations should prioritise proximity by:

- keeping communities together as much as possible
- using recovery funds to support local economies—by using local businesses, contractors and tradespeople.

Build temporary housing villages as a last resort

Temporary housing villages should be a last resort because of:

- their very high cost
- their slowness to build
- the risk of increasing social tensions
- that too often there is no plan for their use beyond being temporary housing.

Recognising that temporary housing villages are costly and problematic, advocate their use only as a last resort. As discussed in Section 5.2.2, if temporary housing villages are used, a succession plan for their later use should be clarified at the time of design and planning.

Be aware of vulnerable individuals, households and communities

'Vulnerable people' can include:

- the increasing numbers of people without disaster housing insurance
- those who have little choice but to return to live in damaged or dangerous properties
- people living 'off grid'
- people living in non-recognised dwellings that may not be eligible for grants
- people who feel they have no other choice than to live in abandoned housing
- people on low incomes who may find themselves homeless.

Linked to this awareness may be the better enacting of Vulnerable Persons Registers to ensure that support is provided where it is especially needed.

Develop transparent policies for buybacks and managed relocation

Promote buybacks and managed relocation as positive recovery strategies, being aware of their complexity and risk of being socially divisive. Buyback schemes should be sped up in their delivery, learning from the problems of slowness experienced after the 2022 Northern Rivers floods in New South Wales, and following the 2009 Victorian Black Saturday bushfires.

Encourage build back better policies

Linked to insurance is the need to build back better, and not to only cover replacement costs. Build back better principles in post-disaster rebuilding could be enacted across all jurisdictions and sectors and could be factored into government and private sector thinking, supported by insurance and other mechanisms that promote improvements rather than replacements.

5.2.3 To strengthen all aspects of PPRR

Stronger Local Government Authorities

While central to recovery, LGAs often lack the mandate and resources to be more effective. All evidence points to better recovery outcomes when decisions are made locally. Strengthening LGAs to this end would take time and resources, and deliberate decisions and policy formulation from other tiers of government, but would be a strong step in the right direction.

Reform home insurance

Address the unaffordability of home insurance premiums by exploring alternative mechanisms with greater involvement by the federal and state/territory governments to enhance recovery capabilities. There may be a stronger role here for government to take on, as insurance is likely to become more expensive without non-market intervention. The Australian Government could explore establishing a federal insurance scheme for those who cannot afford to pay increasing premiums, learning from programs such as the US Government's National Flood Insurance Program (NFIP), discussed earlier.

5.3 How could government and industry work together to overcome current shortcomings relative to data-sharing initiatives and what should be the priorities?

While data-sharing initiatives exist, scaling is hindered by a lack of agreement on the scope and use of data, and by insufficient data-sharing frameworks. Improvement of coordination and standardisation of data, as well as coordination of users working across different government agencies, jurisdictions and sectors, remains a priority for developing better disaster risk reduction and preparedness measures.

Achieving seamless integration of digital tools for data sharing and analysis in decision-making requires government bodies to:

- align their digital proficiency
- enhance the digital competence and readiness of both public institutions and professional organisations.

For this integration to be effective, it must be underpinned by:

- updates to governance frameworks and protocols
- Implementation of targeted initiatives aimed at removing structural obstacles, particularly those related to data sharing.

As the participants in the Inquiry Panel meeting pointed out, we can learn how to do this effectively from other industries, such as the medical field.

To move forward effectively, it is necessary to establish a shared understanding of risk among all stakeholders, which can be achieved through the coordination, aggregation, and dissemination of relevant information. Currently, there are no clear and consistent legislative requirements or mechanisms in place to record and disclose risk. The insurance industry is leading the conversation in seeking to bridge the gap between communities' and households' needs and government processes.

Research participants, including those involved in the inquiry, consistently emphasised the need to improve this process. Specifically, they highlighted the importance of empowering all parties involved to make informed decisions and actively participate in the decision-making process. Currently, the risk assessment approach used is static in nature. The risk is established, and there is no mechanism to demonstrate how it changes over time, either:

- for the better—when resilience-enhancing measures are implemented
- for the worse—when risk increases.

It is vital to modernise and create dynamic tools for risk assessment and data tracking. It is essential to deploy systems capable of monitoring and adapting to evolving risk conditions to provide an accurate, ongoing assessment.

Initiatives such as the Bushfire Resilience Rating Home Self-Assessment App,[7] developed by the Resilient Building Council (RBC) funded by the National Disaster Risk Reduction Funding Scheme, and endorsed by Suncorp and NRMA Insurance, clearly demonstrates how different parties can collaborate to address current challenges.

However, while these types of initiatives are developing and testing ways to move forward, they require a contextualised legislative framework in order to be effective and scaled.

5.4 Final remarks

This inquiry has focussed on how to improve coordination in housing and disasters in three key areas: planning and disaster policy; between immediate recovery and longer-term resilience; and data.

It is well known is that disasters such as cyclones, floods and bushfires are becoming more frequent and intense, fuelled by climate change. Also, housing demand, which is already high and poorly served in Australia, is set to increase as populations increase significantly.

This means the challenges are increasing, and we need to get better at all aspects of disaster prevention, preparedness, response and recovery.

During a consultation for this Inquiry, one expert said that disasters and housing are a 'wicked problem'; that is, there are no clear solutions, and there are multiple perspectives on what can and cannot be done. While this may be true, there are approaches that are moving in the right direction. This includes a recognition among agencies, experts and communities that business-as-usual is not an option and change is needed.

In planning and disaster policy, there is a recognition that these two worlds are overly siloed and need greater recognition of each other's priorities. As one expert powerfully said, and which we have used as a key finding, 'disasters need to be a planning priority'. The fast-evolving generation and use of data is also recognised for its growing central role, and consequently, greater sharing and coordination are required. Post-disaster temporary housing is also well-understood as frustrating, and to those who look at the evidence, temporary housing villages need to be carefully used, if used at all, as an approach. Finally, and perhaps above all, the voices of those affected need to be better woven into policy and practice—localised responses supported by enabling policies are those that are most effective.

7 https://rbcouncil.org/resilience-ratings/

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