Post Disaster Temporary Housing

An Applied Literature Review

for SOCIAL RECOVERY REFERENCE GROUP (SRRG)

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Cover Photo: Temporary Housing Village, Kinglake, 2009. Photograph by Peter Johns

It is critical to anticipate the challenge of providing housing assistance that meets diverse individual, household and community needs.

Meeting urgent housing needs while enabling individuals, households, and communities to rebuild and restore their way of life is a complex equation that requires all those involved in disaster housing -including all levels of government, nongovernmental organizations, and the private sector -to navigate a broad range of competing and interdependent factors.

Federal Emergency Management Agency (FEMA) National Disaster Housing Strategy, 2009

The optimal framework for response and recovery is one that is federally supported, state managed, and locally executed.

Federal Emergency Management Agency (FEMA) Strategic Plan, 2018–2022

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Executive Summary

Background

This report addresses the issues that face disaster recovery agencies in Australia in providing temporary housing for people displaced from their homes by disasters. This report commissioned by the Social Recovery Reference Group (SRRG) was undertaken by RMIT, an independent third party and provides suggested findings and recommendations that may be utilised by disaster recovery and housing stakeholders. The SRRG supports the development of policy and strategies relating to the human, social and community consequences of disasters. In this capacity, the SRRG has identified significant challenges in supporting displaced people with timely and equitable access to emergency and temporary accommodation following disasters and assisting them on a path to stable housing.

Within Australia and globally, many different approaches have been developed to support people in their housing journey after disaster. However, the many differences among affected communities, and amongst people in the one community, mean that "universal housing solutions" do not work and, thus, advice and planning have to be tailored on a family-by-family, and/or cohort-by-cohort basis. As a result, this report seeks to support the SRRG and related agencies when deciding appropriate approaches to use in post-disaster housing, factoring in the scale of a disaster and varying community cohorts.

Research approach

The research was undertaken as an applied semi-systematic literature review with a primary intended audience of policy makers and front-line staff responsible for post-disaster housing recovery. The analysis of the issues, leading practices, implications and recommendations from the literature review were shared with members of the Project Reference Group who provided feedback on their accuracy, value, and feasibility and revised accordingly.

Findings

The report addresses three ways of delivering post-disaster housing services in Australia in ways that are contextually relevant to current practices in housing recovery, the challenges that relevant agencies are facing, and innovative solutions that they are adopting. This contextual analysis is provided in Chapter 2. Chapters 3, 4 and 5 present the findings in relation to three key themes: (1) leading practices in housing recovery in Australia and internationally (Chapter 3); (2) innovative approaches to, and models for, effective temporary housing practices (Chapter 4); and (3) decision making for post-disaster housing (Chapter 5). These three chapters provide an analysis of the relevant research and practice literature on these themes to develop a set of relevant tools or strategies and recommendations.

1. Leading practice in disaster housing recovery

In Chapter 3, the analysis of leading practices in housing recovery led to the development of a checklist of actions that could be used to identify appropriate actions by housing recovery officers and their agencies in providing and managing emergency and short term accommodation and temporary housing. The checklist was developed from research on two key principles – habitability and *communitas* – and contains criteria for achieving eight categories of leading practice: Community Engagement & Participation, Location, Safety, Health, Comfort & Privacy, Cultural & Special Needs, Community & Connection, and Social & Technical Support Services.

2. Innovative approaches to temporary housing

In Chapter 4, evidence is provided on innovative approaches to, and models for, effective temporary housing practices based upon the concept of resilient housing recovery, which is identified as having at least five dimensions: Wellbeing, Liveability, Sustainability, Community Connection, and Viability. Together, these dimensions are argued to change the focus of recovery away from many current practices that often result in "replacement recovery" to resilient housing recovery. This change of focus has two major implications:

- The planning of post-disaster housing and infrastructure programs needs to be become one of the priority strategies in pre-disaster preparation; and

- Strategies are needed to establish Temporary Housing as the first step in the design and construction of on-site Stable Housing to minimise the social, economic and environmental costs incurred when displaced people spend extended periods of time in Temporary Housing.

These implications are explored through case studies of (i) strategies and tools for pre-disaster planning of post-disaster housing recovery, and (ii) the successful development of a two-phase model for constructing Stable Housing through a "temporary-to-permanent" construction strategy. In this model, the first phase is a permanent core house based upon a pre-fabricated housing module that can be extended once insurance or other funds are available. This model replaces the need for a "temporary house" with a "transitional house".

3. A decision-making framework for resilient housing recovery

Chapter 5 integrates the lessons from leading practice (Chapter 3) and housing models (Chapter 4) into the project management cycles of housing recovery agencies. This is done through proposing a Decision-Making Framework for serving the habitability and *communitas* requirements of displaced communities through case managing their needs and assets through wrap-around services. The Framework also seeks to integrate the iterative steps in project management and to use the housing process as a lever for overall recovery. This involves aligning decisions at strategic and operational levels and managing the trade-offs between issues of location (urban v rural), tenure (owning or renting prior accommodation), housing types (e.g., durable or demountable foundations), and procurement (e.g., flatpack kit v prefabricated modular houses).

There are nine such decision categories in the Framework: Consultation, Pre-Disaster Planning for Housing Recovery, Situation Analysis after a Disaster Event, Recognising Cohorts of Displaced People with Different Needs and Assets, Identifying and Selecting Housing Model Options; Providing Agency Wrap-Around Support Services; Using Housing Decisions to Promote Local Economic and Social Recovery, Program Design and Delivery, and Monitoring and Evaluation. While brief examples of the types of decisions to be made in each category are provided, the chapter also provides a detailed analysis of a fuller range of decisions in two decision categories: Pre-Disaster Planning and Monitoring and Evaluation.

Recommendations

Each of these three chapters provide recommendations for policy and/or practice to better serve the Temporary Housing needs of people displaced by a disaster and unable to return to their homes even four or more months after their displacement. These recommendations are:

1. **Terminology**

Develop a standard set of terminology to describe the phases and types of accommodation displaced people may access on the path to stable housing and to be adopted by State and Territory recovery agencies. The terms recommended for consideration are: Emergency and Short-Term Accommodation, Temporary Housing and Stable Housing.

2. Principles

Adopt common principles of leading practice in post-disaster housing recovery including community connection, wellbeing, liveability, viability, and sustainability, for deciding accommodation and support options for people.

3. National Principles

The Commonwealth and State/Territory governments should extend the agreed principles of disaster recovery to include principles of resilient recovery.

4. Guidelines

Develop resources and guidelines to support planning and operational response for post disaster temporary housing.

5. Capacity Building

Develop capacity building resources and programs for State/Territory agencies and local governments to support pre planning for disaster temporary housing.

6. Funding

Recognise different cost implications of temporary housing programs including indirect costs. Develop funding streams to address the priority needs.

7. Further Research

Undertake research into post disaster temporary housing topics such as:

- Improving housing resilience through land-use planning and building codes.
- Learnings from previous disasters on suitable approaches for different communities and contexts.
- Utilisation of innovative construction technologies, materials and methods.
- Utilising permanent prefabricated housing modules that transition from temporary to permanent.

8. Pilot Project

Resource, trial and evaluate a pilot program to identify ways of achieving a two-phase approach to assisting home-owners and renter households into stable housing.

9. Decision Making Framework

Adopt the outline of a Decision-Making Framework for Disaster Housing Recovery provided in this report to provide a basis for the development of tools that can be used by multiple stakeholders in housing recovery programs and projects across different parts of Australia.

10. Capturing Learnings

Establish a national repositories of evaluation reports and support processes for regular cross-case analysis.

1

Introduction

In the 21st century, the world is facing a new normal, one that is defined by constant disasters. From wildfires raging in previously untouched forests to increasingly intense hurricanes and flooding, it's becoming evident that our planet is undergoing profound changes. The question is no longer whether we will experience disasters but how we can better prepare for and mitigate their impact.[1]

1.1   Background

This report addresses the issues that disaster recovery agencies in Australia are facing in providing temporary housing for people displaced from their homes by disasters.

Increasingly driven by the changing climate, natural hazards in Australia are becoming more frequent, intense, and devastating in their impacts. The national *State of the Climate Report 2022* attributes much of this to a pattern of rising temperature and resultant increases in severe fire weather as well as rainfall, cyclones, and flooding in Australia's north and more regular and intense droughts in the south.[2] That report predicts that these changes are irreversible, even in the medium to long term, creating a growing potential for concurrent and cumulative large-scale disasters to occur. At the same time, Australian cities are growing to provide homes, work, and the health, education, and other services required by our rising population numbers. KPMG reports that as a result, 70 per cent of Australians are now living in a Local Government Area impacted by at least one disaster in 2022, a figure more than double the annual average over the past decade.[3]

Putting these climate and urbanisation trends together means that civic infrastructure, residential dwellings, and commercial and industrial buildings are being increasingly exposed to natural hazards and the risks of deaths, injuries and damage rising as our population ages and inequalities between communities remain almost intractable. This increase in vulnerability is occurring at the same time as urban expansion continues in at-risk areas, such as floodplains and fire-prone areas, where often the poorest members of the community are increasing forced to live due to the high costs of housing in less vulnerable areas.

The resulting impacts of disasters are long term, cascading, and disproportionately affecting vulnerable groups who have fewer capacities and resources to prepare for, respond to, and recover from disasters. These are also the disaster-impacted groups who generally require the most appropriate and cost-effective models of temporary housing most immediately.

The costs of disaster damage in Australia are forecast to reach $73 billion per year by 2060.[4] The intangible costs of disasters (such as family violence, mental health issues and other health challenges, unemployment, reduced school outcomes, and crime) are estimated to be equal to, or greater than, the tangible costs.[5]

This report focuses on both the tangible and intangible impacts of disasters in Australia. It is concerned with the impacts of losing one's home to disaster damage and the contributions of government and community agencies in assisting families with temporary accommodation until they can return to more stable housing situations.

As such, the report is based upon four assumptions:

1. **Disasters affect people in many diverse ways, generating social, and emotional impacts that are often just as severe as the physical and economic ones**. Australia has a history of recurring floods, cyclones and bushfires damaging and destroying building and settlements, displacing people from their homes and their sources of income and depriving them of a sense of community and a sense of place. This is at a time when assistance is needed most but it is also the time the availability of many public services is being undermined by damage to critical infrastructure and utilities. Disasters do not occur to people in isolation. Indeed, for communities and individuals already experiencing complex social issues or crisis, a disaster can exacerbate these.[6]

2. **Post-disaster recovery therefore involves the repair and rebuilding of such infrastructure, re-establishing telecommunications, energy, water, and transport systems as well as the commercial and public services needed for a society to function**. Recovery also involves revitalizing the local and wider economy to help restore people's livelihoods. Psychosocial recovery and mental health are also important so that displaced people can overcome any emotional shocks, grief or trauma arising from the disaster. Lastly, recovery requires reflective action to ensure that the original underlying vulnerabilities that contributed to a disaster are mitigated to strengthen resilience to disasters in the future.

3. **However, once the emergency rescue and relief operations are completed, the journey to recovery first requires a place to live that is more than just a roof overhead**. The dwelling may be temporary – for months or even several years in some cases – but it needs to be a place to stay and a 'home' that can contribute to the processes of healing, and the provision of support services that not only aid in these healing processes but also advise on decisions that can lead to return to stable housing, whether this be to a repaired or newly-built home or in rental accommodation.

4. **Current post-disaster housing systems in Australia may not be "broken" as has been alleged of such systems in the USA.[7] Nevertheless, there is always room for improvement.** One way to achieve this could be through adopting both nationally standardised terminology around the provision of post-disaster housing and local area/regional approaches to planning for housing recovery before any disaster occurs. Commissioning this report is evidence that senior staff in relevant government agencies are seeking practical ways to improve post-disaster housing services in Australia. The report also acknowledges that significant innovations in the planning and delivery of improved post-disaster housing within Australia are being trialled to deliver even better temporary housing programs to disaster impacted communities across the country.

1.2 Purpose

This report has been prepared for the Social Recovery Reference Group (SRRG), an independent advisory group to the Australia & New Zealand Emergency Management Committee (ANZEMC) through the Community Outcome and Recovery Sub-Committee (CORS). The SRRG supports the development of policy and planning relating to the human, social and community consequences of disasters.

In this capacity, the SRRG has identified that there are significant challenges in supporting displaced people with timely and equitable access to appropriate emergency and temporary housing following disasters across the country. Successfully negotiating the experience of living in such accommodation and finding a stable home in which to live is fundamental to regional and national recovery processes.[8] Not being able to access suitable accommodation, in either the short or longer term, is a major cause of stress not only on individuals but also on the time and resources of social support services. This, in turn creates a legacy of social and economic dislocation that can linger for many years after the original disaster.

Within Australia and globally, many different approaches have been developed to support people and communities in their housing journey after disaster. Some of these are successful but many are not.[9] This is often a function of the complexity of disaster recovery where decisions about providing immediate shelter for displaced people have to be made quickly but will have long-lasting impacts. The many differences among affected communities and amongst people in the one community also mean that "universal solutions" do not work and, thus, advice and planning have to be done on a person-by-person, family-by-family, and/or cohort-by-cohort basis.[10]

As a result, this report seeks to support the SRRG and related agencies when deciding appropriate approaches to use in post-disaster housing in different community contexts, factoring in the scale of a disaster and different community cohorts.

The key research question underpinning this report is:

> **What should government reconstruction and recovery agencies consider in order to improve planning and decision making for accommodation needs after a disaster, and to support people's transition to stable housing?**

Answers to this question are sought through an applied literature review guided by the following **objectives**:

1. To identify on key language and terminology to describe the accommodation phases after disasters to improve consistency between jurisdictions.

2. To identify and assess key frameworks and best practice principles to inform the program design and implementation of emergency and temporary accommodation, including on accessibility and liveability.

3. To identify and advise on socio-economic, cultural, and environmental considerations that promote liveability and inclusivity in temporary housing

4. To identify and assess emergency and temporary housing models (with a focus on the latter) and their applicability across diverse social contexts e.g., renters, levels of insurance, urban dwellers, remote communities, and extreme hot and cold climates.

5. To identify and assess key decision-making methodologies and frameworks; that include contextual analysis, participation, role, and levels of engagement.

The review focuses in particular on the longer-term temporary housing (beyond the first four months post-disaster) rather than emergency and shorter-term accommodation needs. This was because longer-term temporary housing was seen the Project Reference Group as the most pressing and intractable of these needs and the one requiring the most government attention and funding.

Thus, the report is characterized by the following priorities (as in Figure 1):

- An applied not academic focus in the review, analysis, and synthesis of the relevant literature.

- An intended audience of policy-makers and front-line professionals.

- An emphasis on housing issues beyond the first four months after a disaster, i.e., temporary, interim, or transitional accommodation prior to a stable, long-term solution is available.

- A goal of identifying leading national and international practice so that agencies can ensure that:

    o Displaced people can enjoy an optimal quality of life in their transition to stable housing;

    o Appropriate approaches to housing systems and types of housing can be considered for temporary housing; and

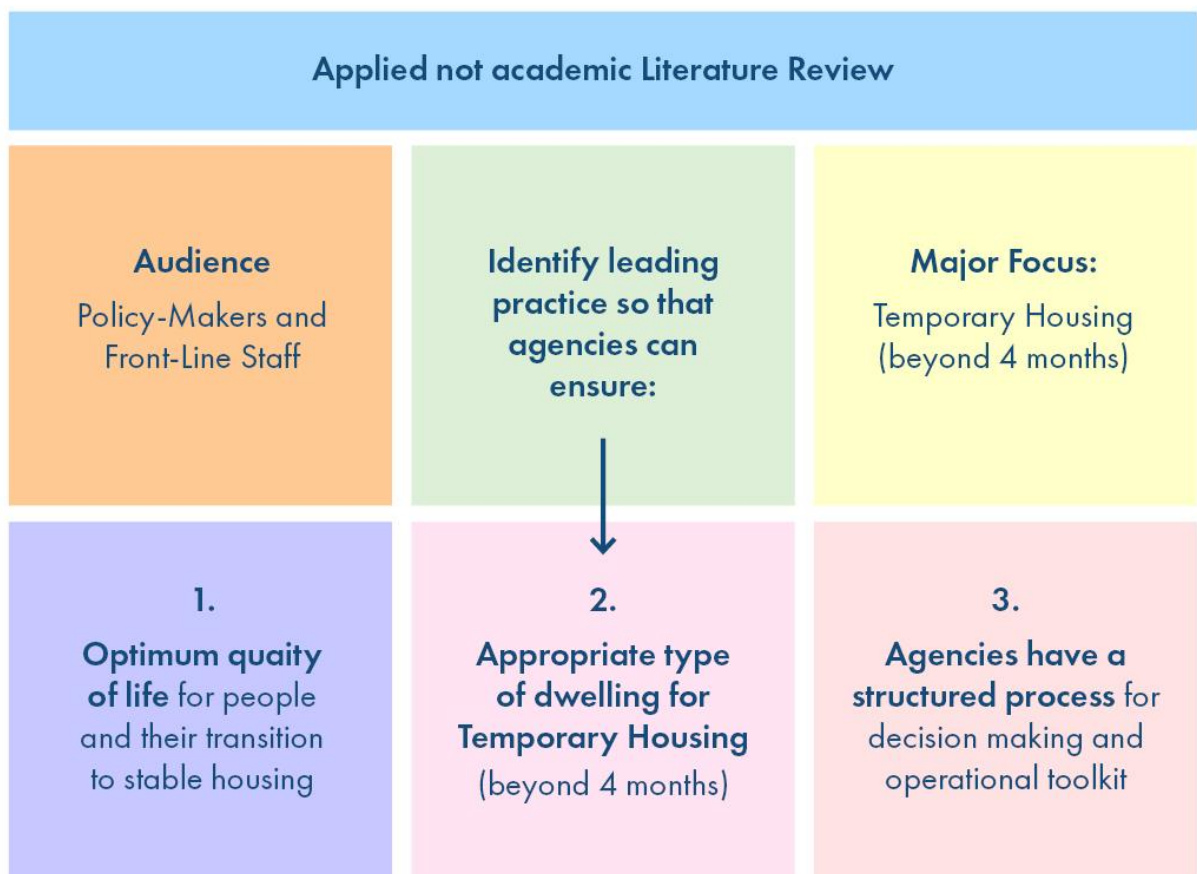   o Agencies have a structured process of decision making in relation to such housing.

Figure 1: Priority aspects of the report

1.3   Approach

SRRG requested that a review and analysis of relevant academic and grey literature be conducted to address the research question and objectives. This was undertaken in four steps:

1. *Scoping*. An analysis of "Web of Science" and "Scopus" databases and AIDR publications identified relevant search terms (e.g., emergency shelter, housing, relief, temporary, shelter, recovery, transition, insurance, trauma, engagement, etc.). These were then used as descriptors for a Boolean Search to identify all relevant publications.

2. *Screening*: The expected large number of "returned" publications (over 700) were reduced by screening these publications by relevance, recency, geographical spread, research methods, validity, and potential generalizability. This resulted in a list of 120 publications for detailed analysis

3. *Semi-systematic analysis.* This form of analysis then built upon the scoping of the field and screening steps to provide a synthesis of the themes in the selected publications to address the research question and objectives. The review was 'systematic' in that it followed an explicit strategy to identify themes relevant to the specific research question and objectives, thus enabling concepts and examples to be classified, sorted, and arranged, relationships across these identified, and implications recognized.

4. *Review and revision*. The resulting analyses, implications and recommendations were shared with members of the Project Reference Group who provided feedback on the accuracy, value, and feasibility of the various sections of the report. The feedback was discussed, and appropriate revisions made.

1.4   In-Scope and Out-of-Scope

The field of post-disaster housing is multi-disciplinary, drawing insights from architecture, planning, construction management, engineering, social work, anthropology, sociology, economics, geography, urban development, service design, insurance, humanitarian action, and international development. Perspectives from all these are relevant to this study.

Out-of-scope in this project are studies of:

- Issues relevant to humanitarian disaster and housing responses
- Evacuation centre structures and management
- Permanent housing solutions including housing design
- Review of the current Commonwealth Disaster Relief Funding Arrangements (DRFA)
- Key informant interviews with stakeholders active in recovery.

Issues related to emergency shelter are not investigated in detail for two reasons: (i) the short time frame and resources limitations of the project, and (ii) SRRG advice that temporary housing is a much more immediate priority to housing recovery agencies in Australia. However, even the use of terms such as "emergency shelter" and "temporary housing" in the literature poses a major challenge to researchers in this field. This is due to semantic inconsistencies in their use in both in the academic literature and in professional practice internationally and in Australia.

Addressing this issue is one of the key objectives of this report and is discussed in Section 3.3. However, first, Chapter 2 provides a brief overview of patterns of practice in temporary housing provision and management in various jurisdictions in Australia.

2

Current Temporary Housing Practices around Australia

Understanding the role of housing in disaster planning and recovery presents an opportunity to leverage housing for improving people's health and wellbeing. The right approach to housing assistance has the potential to greatly ameliorate the negative health effects. Interventions might require divergent strategies for populations in different precarious housing conditions, and policies should target long-term housing support services for highly vulnerable groups.[11]

2.1   Introduction

Damage to civic, economic, and residential infrastructure from disasters across Australia forces the evacuation (voluntary or directed) of significant numbers of people. This displacement may be for a short time but is often for extended months and, sometimes, years.

Initially after a flood or fire, people may move in with family or friends, or to a hotel/motel or caravan park. Many communities seek emergency shelter in a local or state government organised evacuation or relief centre. If homes are not habitable when the emergency recedes or if transport, water, energy, or other critical infrastructures are severely damaged, the period in emergency accommodation may be extended. Those remaining in relief centres are then often transferred to hotels, motels, or other forms of short-term accommodation, often with financial assistance from State/Territory agencies and the Commonwealth government.

As months go by, the emergency response and relief phases of operations blend into early and medium-term recovery. Displaced families, households and communities look forward to moving back "home", whether this be to their privately owned or rented accommodation. However, delays to housing repairs or replacement can often be significant, disrupting the best-laid plans. Also, governments are recognising that there is long-term value in not allowing people to move back to dangerously vulnerable sites and seek to establish land buy-back and relocation programs. As wise as this is, even greater delays are necessarily incurred. Such factors mean that, as people move from emergency and short-term accommodation into what is called (long-term) temporary housing, they may be in for extended periods of many months or years in a temporary home. The needs of such people are a key priority in this report.

Ensuring that displaced people can negotiate this process as expeditiously and comfortably as possible is complex – administratively, socially, economically, politically, and most importantly, emotionally – with the added difficulty that relief and recovery agencies and their staff are working under conditions of uncertainty which makes detailed preparation and pre-planning difficult. Such difficulties often mean that not only do displaced people remain in relatively unstable housing longer than they might need to be but also that longer-term recovery processes are protracted.[12]

Not surprisingly, this broad pattern reflects the pattern of four overlapping phases of relief and recovery after a disaster: Rescue and Relief, Early Recovery, Long-Term Recovery, and Normalisation (Figure 2). Quarantelli described the matching four phases of post-disaster housing as Emergency Shelter, Temporary Shelter, Temporary Housing, and Permanent Housing.[13] Other terms are also used in the literature, including T-shelter, transitional shelters, core shelters, interim housing, transitional housing, and progressive housing, each with a specific meaning related to alternative solutions to different housing needs and contexts.[14]
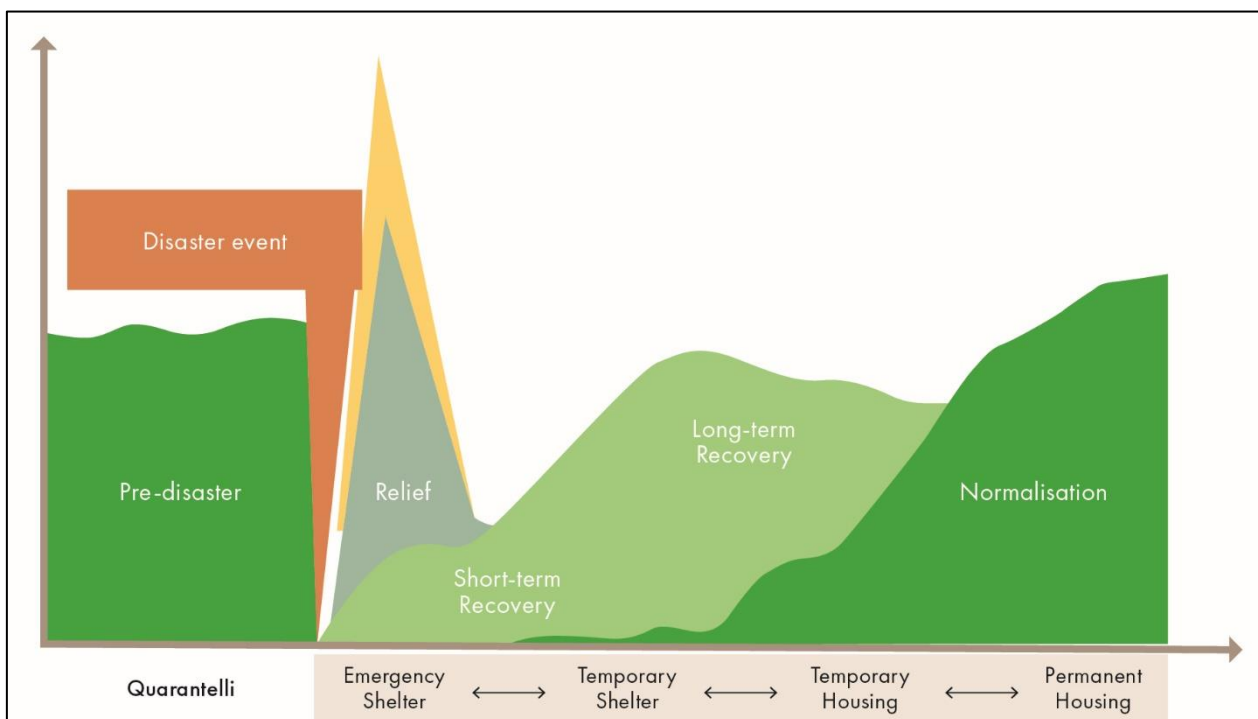
Figure 2: Overlapping phases of disaster recovery matched to Quarantelli's four forms of post-disaster shelter and housing[15]

These many terms often reflect the differences between "sheltering" and "housing" with the former referring to a place to sleep indoors in an emergency, perhaps for a few days or weeks, while the latter refers to an independent and more stable living situation where a displaced person or family can store food and belongings, prepare meals, enjoy private bathroom facilities, and meet a majority of their psycho-social needs in a fully functional, self-contained space.

Similar phases and terms to those identified by Quarantelli are used across recovery agencies in Australian States and Territories. Interestingly, the Queensland Temporary and Emergency Accommodation (TEA) Plan adds an extra noun to the name of each phase: emergency housing *response,* temporary housing *recovery*, and housing *stabilisation* to denote the purpose of each one.[16]

However, it important to emphasise that neither Quarantelli nor Australian disaster housing agencies view the phases as sequential or as phases through which all displaced people must progress. As Quarantelli and other researchers have noted "Many households never progress through each phase, others jump around, forward, and back, and still others become 'stuck', such that temporary housing becomes permanent".[17] Rather, the four identified types of accommodation are best seen as "a recognizable way to classify different forms of disaster related housing and shelter".[18]

However, every disaster is different as is every community and agency that seeks to support people who are displaced by a disaster. As a result, particularly in a federated nation such as Australia, understandings differ across the States and Territories about how best to provide housing support to displaced people – even down to the terms used to describe the various forms of accommodation. Thus, the next sections of this chapter seek to provide an overview of the terms and processes used in Australia's States and Territories to provide accommodation services and associated support for people displaced by a disaster. They also outline the challenges being faced and the innovations that are being implemented or planned as a way of identifying potential approaches for wider consideration.

2.2   Australian Patterns of Disaster Housing

To understand the context for this report, a collection was made of available documents related to policy, programs, projects, and evaluation reports on the planning, delivery, and management of temporary housing after disasters at national, State and Territory levels in Australia. A summary was made of these and sent to relevant State/Territory members of the Project Reference Group, for review, especially to identify:

- The terminology used to refer to different forms of post-disaster shelter and housing
- The significant challenges being faced, especially for medium- to longer-term temporary housing
- New, innovative strategies for medium- to longer-term temporary housing being planned or currently being trialled.

Figure 3 indicates the general patterns of terminology as well as significant disparities in the range of support provided to displaced households across Australia. This may be due to the different types, frequency, and severity of disasters and their impacts in various States/Territories. This is despite common national arrangements for post-disaster support to them. This situation led the Royal Commission into the National Disaster Arrangements following the severity of the 2019-2020 "Black Summer" bushfires to urge increased standardisation of terminology across Australia in all aspect of disaster risk reduction and recovery.[19]

While the Royal Commission report was referring primarily to emergency shelters and aspects of short-term temporary housing, these dimensions of habitability are of equal relevance to temporary housing; perhaps more important as disaster displaced people may be living in the latter for several months and sometimes years. Attention to this message in the field of housing recovery would increase equity for displaced people across the country as well as provide the economies of scale required for cost-efficiency in planning disaster housing recovery. It would also provide significant savings to the cost of implementing innovative housing options that can enable people to return to stable housing more swiftly and the housing process to contribute more effectively to overall social and economic recovery.

	Evacuation Centre	Short-Term Temporary Accommodation	Medium- to Longer-Term Temporary Accommodation
Australian Capital Territory	Not defined. Some public schools and colleges are designated evacuation centres in an emergency.	Short-term assistance, with provision and payment of accommodation in the immediate aftermath of a disaster for up to two nights.	Not defined. Current social recovery services do not extend to this form of housing.
New South Wales	Defined as a safe and appropriate place to stay, and sleep, during an emergency when a person's primary residence is inaccessible or unsafe due to an emergency.	Emergency Accommodation may be offered to disaster affected people who cannot return home for the foreseeable future.	A safe and appropriate place to stay when a person's primary residence has become uninhabitable (3 months - two years).
Northern Territory	Recovery planning is embedded within the Territory Emergency Plan. Accommodation options are developed as part of the response to a disaster depending upon the location of the disaster event and impacts to road networks and other critical infrastructure. Thus, options are developed on a "just-in-time" basis and tailored to individual situations. Options include exploring the viability of temporary housing as close to the home locations of affected populations, even in remote locations.		
Queensland	Categorised as "Emergency Housing Response" Local accommodation options supported Potentials of transportable housing options.	Categorised as "Temporary Housing Recovery" on the path to "Housing Stabilisation." A multi-faceted approach, including relaxation of eligibility criteria for access to Housing Service Centres, coordination with real estate offices, and formation, as appropriate, of local Housing and Social Sub-Committees to facilitate a wide range of interim housing options	
South Australia	Traditionally has not opened evacuation centres. Relief Centres are established to provide initial care, comfort, information, and grants when activated	Emergency accommodation is arranged for impacted community members where the scope of the event requires. Initially provided for 2 days but reviewed as needed and may be extended up to 14 days.	Minderoo Pods were provided following the 2019-20 bushfires, initially for 12 months. Lack of tradespersons and materials and remote locations impacted the pace of housing recovery, resulting in some pods still being on location on Kangaroo Island with the last 3 pods to be removed by December 2023.
Tasmania	An identified location or facility that provides information and temporary shelter and basic services to meet the immediate personal needs of people affected by an emergency.	Accommodation that is required during an emergency in the immediate period of time between displacement and return to current places of residence.	Recovery and Restoration Grants provide assistance to meet medium to longer term needs for people unable to reside in their principal place of residence and/or have incurred substantial property damage and/or substantial loss of personal household items essential for daily living.
Victoria	Evacuation centres generally remain in place until a "safe to return" order is issued by the relevant agency.	Emergency accommodation may also be used with the same intent as an evac centre (e.g. accommodation support while people are evacuated 24/48 hours).	General intent is accommodation support for 6-24 months.
Western Australia	A centre that provides affected people with basic human needs including accommodation and water.	Short- to medium-term accommodation for people made homeless by an emergency or due to evacuation ranging from.	Not defined.

Figure 3: Patterns of post-disaster emergency sheltering and temporary housing across Australia

2.3 Significant Challenges

The analysis of the collected documents and meetings with members of the Project Reference Group indicate common challenges to improving the planning and delivery of effective disaster housing recovery. Examples of these challenges included:

1. The **inconsistent terminology and policy settings** across Australia.

2. **Changes and inconsistency in the agencies responsible for housing recovery**. The Reference Group member from one State provided the example of four different administrative arrangements in a three-year period in which recovery from:

    - A bushfire in January 2021 was managed by the local council and the State Department of Fire and Emergency Services (DFES);

    - A tropical cyclone in April 2021 was managed by DFES;

    - COVID-19 shelter was managed by the Department of Health and the Department of Communities; and

    - Severe flooding in a remote region in January 2023 was managed by the Department of Communities.

    There were important reasons for such changes, but recovery efforts suffered from the lack of collective memory and expertise across the executing agencies and individuals and the consequent need to "reinvent the wheel".

3. **Emergency accommodation issues** related to:

    - Over-reliance on hotels and motels in many areas but a lack of them in rural and remote locations.

    - A lack of alternative housing in remote First nations communities that already are characterised by severe overcrowding

    - High-level decisions to close evacuation centres on short notice and before alternative accommodation is available.

    - Low availability of psycho-social support and assistance to culturally diverse and large families.

4. **Local government planning issues** that:

    - Allow people to remain on their own disaster-prone land for indefinite periods.

    - Delays the issuing of permits to rebuild due to over-restrictive planning codes and increased workloads after a disaster.

    - Building codes and planning regulations that mean housing locations and building standards are not resilient in the face of severe disasters.

5. **Renovation and re-building issues** related to, for example:

    - A general lack of pre-disaster planning for post-disaster housing recovery.

    - The recency of concerted action to stockpile reserves of emergency and temporary housing and of surge planning to rapidly expand the production of prefabricated housing modules.

    - Current funding streams do not readily support retaining assets for future disasters.

- Current severity of housing availability and affordability, in general, and particularly for large and culturally diverse families and communities.
- Availability of building tradespersons and building materials.

Many of these issues are being addressed though new and innovative strategies for housing recovery, as outlined in the next section.

2.4   New, pilot, and planned innovations

There is a growing commitment across government agencies to meet such challenges to provide effective and expeditious disaster housing recovery. Among the pilot or planned improvements are the following innovative approaches:

1. Continuous audits of available accommodation options, e.g., public housing stock, rentals, caravan parks, motel/hotels.
2. Early assessment of the areas impacted by the disaster event to determine the number of privately owned/rented dwellings and the number of properties located with the zones most heavily impacted.
3. Provision of short to medium-term rentals e.g., hotels and motels, caravans, tiny homes, mining company dongas (or pods), and prefabricated modular units.
4. Stockpile reserves of emergency shelter units.
5. Establishment of dedicated temporary housing villages, e.g., Gympie Recovery Accommodation Park and the use of accommodation villages from the COVID emergency. (Note: such villages have been found to be problematic in some States for several reasons, including the length of time it can take to construct new ones and the need for skilled staff to manage the social problems that can occur when large numbers of grieving and/or traumatised people are living in close proximity).
6. Recognising that smaller clusters (neighbourhoods) of temporary housing are preferable to one or two large villages in terms of social outcomes.
7. Holistic place-based case management support.
8. Support services are increasingly multi-disciplinary with expertise including psychosocial, wellbeing, and mental health support; technical building support; economic support, youth support; legal assistance; targeted First Nations support, etc.
9. Improved urban planning to mitigate disaster risk and to ensure proximity to existing communities, work, and services
10. Planning for expandable prefabricated housing units
11. That displaced households can remain within their community during their recovery.
12. Considering pre-disaster housing recovery plans at local scales.
13. Development of a culture of independent evaluation of housing programs.

It is within this context of challenges and innovations, that this report addresses three ways of serving post-disaster housing services in Australia. These are: (i) identifying leading practices around Australia and internationally (Chapter 3); (ii) analysing innovative approaches to, and models for, successful temporary housing (Chapter 4); and (iii) developing a decision making framework for post-disaster housing (Chapter 5).

3

TOWARDS PRINCIPLES OF
LEADING PRACTICE

Building permanent accommodation after a disaster takes time for reasons including the removal of debris, the lack of available land, and the procurement of resources. In the period in-between, affected communities find shelter in different ways. Temporary houses or transitional shelters are used when families cannot return to their pre-disaster homes and no other alternative can be provided. In practice, families stay in a standard interim solution for months or even years while trying to return to their routines.[20]

3.1   A Cautionary Note on Sources

This chapter begins with two notes of caution regarding the literature on post-disaster housing. These relates to issues related to (i) the limited range of academic studies with particular relevance to the Australian situation and (ii) the lack of consistency in the use of key housing recovery terms in both the literature and practice. This section and the next address these two concerns.

Research interest in temporary housing post-disaster is rising internationally and is providing valuable advice on best practice principles for the delivery of post-disaster temporary housing across Australia. This research has been translated into manuals by national and provincial/state governments and by many international and national non-governmental organisations (NGOs). However, the lessons to be taken from all this work is not necessarily transferable to the Australian situation for many reasons. These include:

1. **Much of the literature on temporary housing, as much as three-quarters, directly addresses shelter needs following disasters in the less-developed regions of the world through humanitarian efforts**.[21] Much of this assumes that the displaced populations have low levels of expectation for temporary accommodation and low levels of self-efficacy, both of which are not necessarily true and are certainly not characteristics of the Australian population.

2. **The literature from the more economically developed countries of the Global North makes up the balance and is more relevant to Australian conditions**. However, the UK literature on this topic is minimal, as it is from the rest of Europe, Canada, South Korea, and Taiwan, comparatively speaking. Only in the USA and Japan (the latter to a lesser extent) has there been a wider range of studies on post-disaster housing – although this seems to be episodic, coming in waves after major extreme events such as Hurricanes Katrina (2005) and Sandy (2012) in the USA and the Great Hanshin Earthquake (1995) and Great East Japan Earthquake and Tsunami (2011). Academic researchers in Australia and New Zealand have published very little on temporary housing in their countries. As a result, questions and issues related to temporary housing in such countries have been described as "significantly understudied", especially with "little research" on ways of meeting the post-disaster housing needs of different cohorts of people, e.g., according to

family types, social class, ethnicity, or types of disability or marginalisation.[22] Also missing – and of special interest to post-disaster housing agencies – is research on the rate at which households characterised by such differences respond to, use, and shift through, different forms of housing. The US National Academy of Sciences laments this situation as it recognises such studies as particularly valuable in "forecasting the demand for temporary shelter and temporary housing after disasters".[23]

3. **Questions are being asked about the "methodological rigour" of the research designs of many reports on temporary housing.** These include problems with small sample sizes, a focus on a small range of locations affected by wide-spread disaster events, and short term studies with very few long-term studies following the post-disaster housing careers of different cohorts of people following displacement by a disaster.[24]

As a result, extrapolations from the academic literature have often had to be relied upon in this research. However, the "grey literature" of government and agency reports from the States and Territories has proven to be of immense and invaluable assistance despite similar caveats about "methodological challenges" in such reports.

3.2   A Cautionary Note on Terminology

Ambiguous definitions and the divergent usage of terms regarding temporary housing are common in and between different countries, jurisdictions, agencies, and research disciplines. Internationally, Contreras describes "fuzzy boundaries" between post-disaster housing "phases".[25] Boano and Hunter use harsher terms, arguing that the imprecision in terminology creates profound "semantic confusion" that requires "deciphering nuances . . . as the consequences of conceptual confusion may create unwelcome results".[26] In Australia, Brogden and Kennedy argue strongly that:

> The proliferation of shelter terminology and its inconsistent use in the shelter sector impedes development and obstructs new actors. Terminology influences the implementation of coherent sector principles and inconsistent use is a barrier to meaningful engagement from new partners seeking to access shelter-sector knowledge. Further, misunderstood terminology limits the development of new strategic approaches and innovation.[27]

As a result of concern such as these, the 2020 Report of the Royal Commission into National Disaster Arrangements noted that:

> The terminology and features of sheltering facilities can differ across states and territories. Different terminology is used for the same type of facility. For example, a facility providing accommodation and other amenities to those evacuated in Victoria is called a relief centre; in NSW this same facility is typically called an evacuation centre. [28]

Thus, the Royal Commission recommended that "State and Territory governments should, as a priority, adopt nationally consistent terminology and functions for the different sheltering facilities".[29] The inconsistencies in terminology used to denote the different forms of shelter at different phases of recovery indicate that the same is true of the terms used to refer to temporary housing.

The Federal Emergency Management Agency (FEMA) in the USA addressed the problem of terminology in its latest (2020) post-disaster housing guide by using a three-phase framework: Sheltering, Temporary Housing, and Permanent Housing (Figure 4).[30] Given sensitivities about the use of the term "shelter" (as perhaps having negative connotations) and concerns that housing responses may never be "permanent", the FEMA terms are not used in this report. Instead, it uses the terms on the bottom line of the revision of Figure 2 (in Figure 5), *viz.*: (1) Emergency and Short-

Term Accommodation, (2) Temporary Housing, and (3) Stable Housing.[31] Noting that these are overlapping categories (as depicted by the arrows in Figure 4), the paragraphs that follow explain the ways in which these terms are defined in this report.
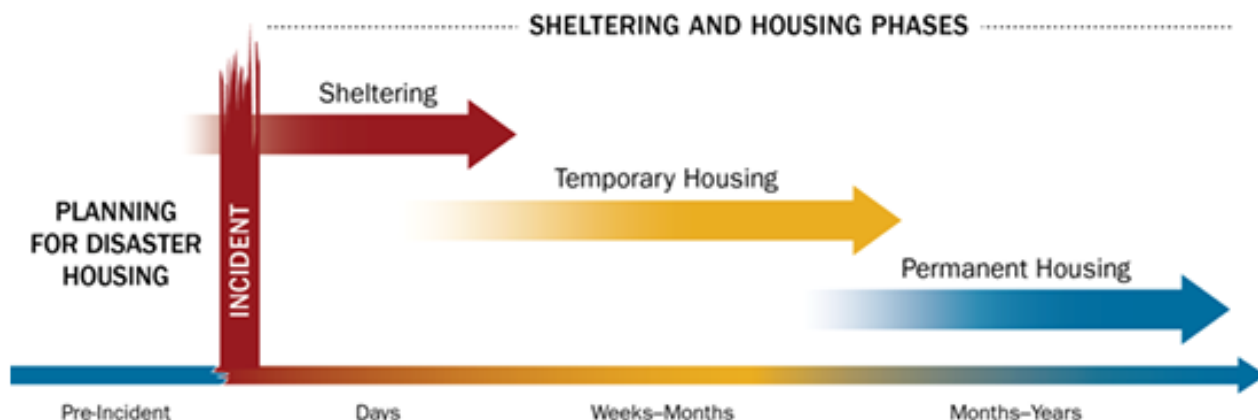

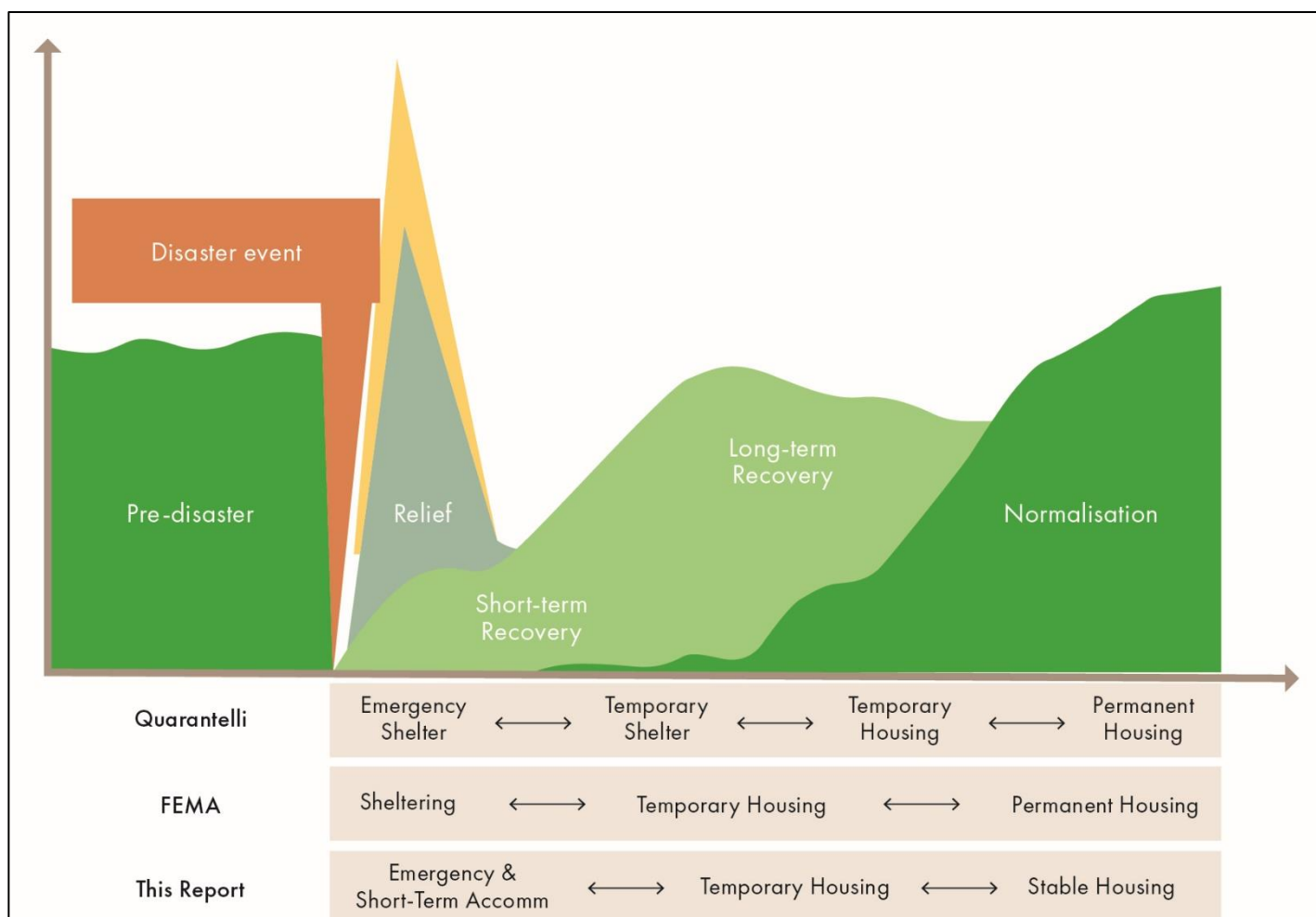Figure 4: New terms used by FEMA for three phases of post-disaster housing[32]

Figure 5: Terms used to denote forms of housing at overlapping phases of disaster response matched to Quarantelli's terms (top row), FEMA (middle row) and the terms used in this report (bottom row)

The terms used in this report

Emergency and Short-Term Accommodation refers to places where people can safely stay for a short period of time during the height of an emergency and in the immediate aftermath of a disaster. Figure 6 indicates that this can be in the house of a friend or in a public mass shelter or in a caravan, hotel, or motel usually with financial assistance from governments. After a few days, perhaps up to a week or two, and if their homes are not yet in a suitable condition for everyday life, people move to short-term options as in the second column of Figure 6. These short-term options are sometimes referred to as "temporary sheltering" and may be "home" for several weeks and months, sometimes longer. Given that private or public rental options are often not available in the quantities required, village-style accommodation, such as caravan or mobile home parks, available work camps, and Manufactured Housing Units or "pods" are utilised.

Emergency and Short-Term Accommodation

Emergency Shelter (0-7/10 days)	Temporary Shelter (Up to 4-6 months)	Temporary Housing (Beyond 4-6 months)
• Family and Friends • Emergency/Relief Centre • Hotels/Motels • Caravan Park or Camp Site	• Family and Friends • Hotels/Motels • Carvans • School/University Dormitories, Army Barracks or Residential Camps • Rented Flat or House (State, Community or Privately Owned) • Villages of Existing or Modular Units	• Family and Friends • Caravans • Rented Flat or House (State, Community or Privately Owned) • Modular or Prefabricated Housing on Private Land • Newly Established Villages of Modular or Prefabricated Housing

Figure 6: The potential range of post-disaster accommodation options[33]

Temporary Housing refers to the various places where displaced people who cannot yet return to their homes, perhaps after four to six months, reside "temporarily" until they can do so, or alternative stable accommodation is available. The third column of Figure 6 indicates the wide range of options for temporary housing with public or private rental housing and caravans, either in caravan parks or on private land (usually rural) have been the most often used options in Australia. These are intended to be a "step-up" from short-term accommodation and to allow people to return to their normal daily activities, such as work, cooking, housekeeping, education, socialising, etc. as far as is practicable. As such, temporary housing is an interim or transitional phase between the period when the disaster occurs, and displaced people are resettled in a stable housing situation. Thus, Sparkes refers to temporary housing as having four characteristics, as it provides:

> (1) physical accommodation . . . [for] disaster survivors who have lost their principal place of residence, (2) while their permanent residence is restored or rebuilt, (3) where it forms part of a

post-disaster rehousing program, (4) and it enables survivors to engage in normal daily activities throughout the recovery process.[34]

Temporary housing is thus crucial to the success of post-disaster recovery as it provides a comfort level consistent with common standards of living and regular social and economic activities that people can associate with the normalcy from which personal and family recovery can intersect with, and be mutually supportive of, a return to a civil society and economic recovery.

Stable Housing is the end point of housing recovery. It may not be a return to one's original home or even home ownership. However, it is a place in which a person, family or household chooses to live with a reasonable expectation of safety, normalcy, and permanence, at least until they choose to leave.

3.3   Habitability and *Communitas*: Principles Underpinning Leading Practice

The international literature on temporary housing, in relation to Shelter and Settlement programs in the humanitarian sector, is grounded in the concept of social protection through social safety net programs for poor and vulnerable people. These take the form of emergency shelters (e.g., tents and shelter kits), food, cash, in-kind donations, and repairs to infrastructure. In fact, the shelter programs of the UN High Commission for Refugees (UNHCR) and the International Federation of Red Cross and Red Crescent Societies (IFRC) call such programs "Shelter and Non-Food Items". This approach provides minimal assistance to displaced people but predominates mostly due to the poor state of humanitarian funding.

However, this approach is not appropriate in countries such as Australia where more funding is generally available to support disaster survivors and people have higher expectations of living and comfort standards and of government action and support. Two alternative principles have emerged in recent years to underpin a philosophy of post-disaster housing programs in countries of the North. These are habitability and *communitas*. Both principles are relevant to serving displaced people whatever their degree of socio-economic well-being. However, they have mostly been written about and recommended in research for housing recovery programs in the more economically developed countries.

Habitability

The term 'Habitability' emerged from research on desirable housing recovery practices in the USA and South Korea. The American Red Cross used the terms: safety, cleanliness/hygiene, privacy, and supporting social diversity and the needs of vulnerable people to assess the qualities of a shelter.[35] These elements well-being. Researchers in South Korea extended well-being to denote habitability as a key underpinning of post-disaster housing.[36] They defined habitability as:

> . . . an essential concept for building and managing a shelter to appropriately accommodate . . . disaster victims, because it includes comprehensive aspects of close association with local communities and strengthen[s] people's will to recover as well as considering people's various needs based on their physical and emotional states. Regarding vulnerable members of the population such as old people and those suffering from disabilities, securing their privacy through a separate space and providing easy access to the majority of facilities in and around the shelter is a crucial factor. Furthermore, pets should be allowed to evacuate with their owner victims.[37]

Figure 7 lists the terms used by these researchers in a study of the habitability of post-disaster accommodation. While these authors were referring primarily to emergency shelters and aspects of short-term temporary housing, the dimensions of habitability are of equal relevance to mid- and long-term temporary housing; perhaps more important, as disaster displaced people may be living in the latter for extended periods of time.

Dimensions	Elements
1. Safety	• Refuge to keep disaster victims' safe • Protection from external threats/weather conditions • Protection of personal belongings
2. Health	• Sanitary environment and facilities for victims' physical/emotional health • Stable maintenance of victims' physical/emotional health
3. Sociality	• Ease of accessing and leaving the temporary shelter • Connection to amenities and local facilities • Providing facilities for daily life • Communication between government officials and disaster victims
4. Comfort	• Providing privacy for individuals and family units • Control of light, ventilation and heating to provide people
5. Vulnerable people	• Providing equal protection for men, women, children, those with disabilities, the elderly and other disadvantaged groups with adequate level of indoor quality
6. Culture	• Inclusive plan for diverse races, cultures and religions

Figure 7: The elements and dimensions of habitability in a study of post-disaster temporary accommodation in South Korea[38]

Communitas

The second concept that has underpinned leading practice in post-disaster housing recovery is *communitas*. This concept emerged from research on altruistic communities following a disaster[39] where it was found that a "particularly rich sense of community"[40] can arise from social stresses or shocks, such as a disaster, and underpin local social and economic progress and betterment. Similar to the role of social capital in reducing disaster vulnerability,[41] *communitas* can contribute to a positive outlook and consensus building in the post-disaster community, "thus aiding the planning process for long-term disaster recovery activities" and in which "[c]o-operation among local citizens in the disaster recovery decision making process can help create a new vision that can produce a community that is socially stronger and ideally more resilient to future disasters".[42] The wrap-around services provided by social and housing recovery agencies are central to achievement of such goals.

Key to the development of *communitas* is providing opportunities for, and encouraging, the active participation of displaced people in three activities (or, at least, some of them). With appropriate support from financial assistance grants and local "wrap-around" services, these include:

- Having the information and skills for personal efficacy to take responsibility for current and future accommodation decisions and plans.

- A sense of empathy and gratitude from which one can provide assistance with small or large relief and recovery tasks to neighbours and friends who have been similarly displaced.[43]

- Participate in community activities designed to develop a common vision for rehabilitating and rebuilding a disaster-impacted area as well as strategic recovery plan for building back better safer and stronger to take advantage of the opportunities inherent in a crisis.[44]

A case study following a disaster in Downey, Texas, examined ways of building *communitas* into disaster recovery programs.[45] Providing opportunities for, and supporting, genuine and transparent participation was central to this with contrasts between the tokenism of much that passes for participation. The Downey case study also identified the conditions that affected the relative degree of success in such efforts and, thus, community leaders, (including recovery agency staff) to seek opportunities for training in building *communitas* into disaster recovery. The focus of such training could include skills for (i) enriching trust among leaders and citizens in the community, (ii) fostering community unity, (iii) facilitating the creation of future visions for the community, and (iv) civic skills for community development and leadership. The researchers argued that, if done successfully, the strengthening of *communitas* could serve to counter the feelings of disempowerment that are often present after a disaster.[46]

3.4   Towards a Framework for Leading Practice

Mindful that all communities are unique and that the impacts of varying types of disasters on different communities vary greatly, it is still possible to recognise the dimensions and related elements of leading practice in planning and implementing disaster recovery housing programs. The dimensions are: Community Engagement and Participation, Location, Safety, Health, Comfort and Privacy, Culture and Special Needs, Community and Connection, and Social and Technical Support Services. Figure 8 lists these dimensions and the criteria or elements relevant to them.

It is not intended that the list of dimensions and related elements be seen as universal, i.e., to apply in every situation. Often, trade-offs will need to be made between needs that arise from the severity of different impacts of a disaster, the characteristics of communities, the scale of disaster devastation and the resulting housing recovery task, the environmental hazard behind the disaster event, the socio-economic-political context of the community, and the resources available for housing programs and recovery. Rather, the dimensions and elements of leading practice are presented as a checklist to aid in planning the nature, aims and scope of the housing program and the particular needed of people in Emergency and Short-Term Accommodation (E&STA) and Temporary Housing TH).

3.5   Recommendations

1. Develop a standard set of terminology to describe the phases and types of accommodation displaced people may access on the path to stable housing and to be adopted by State and Territory recovery agencies. The terms recommended for consideration are Emergency and Short-Term Accommodation, Temporary Housing, and Stable Housing.

Elements	Criteria	E&STA	TH
Community Engagement & Participation	*Agency Ethos*		
	– A formal process for community consultation and responsibility	[ ]	[ ]
	– A formal process for transparency, evaluation, and accountability	[ ]	[ ]
	– Agency commitment to individual & community focus in decision-making	[ ]	[ ]
	– Devolution of appropriate decision-making responsibilities to community as circumstances allow	[ ]	[ ]
	Pre-disaster training to:		
	– Enrich trust among leaders and members of the community	[ ]	[ ]
	– Facilitate opportunities for the community to develop a vision of the future community they would like to have	[ ]	[ ]
	– Build civic skills for community development and leadership	[ ]	[ ]
	During recovery period encourage:		
	– People to be informed and empowered to take responsibility for current and future accommodation decisions and plans.	[ ]	[ ]
	– A sense of empathy and gratitude from which one can provide assistance with small or large relief and recovery tasks to neighbours and friends	[ ]	[ ]
	– People participate in community activities designed to common visions of strategic recovery plans	[ ]	[ ]
Location	*A safe location as close as possible to:*		
	– Known neighbourhoods and work location	[ ]	[ ]
	– Family and friends and access to shopping for basic food and supplies	[ ]	[ ]
Safety	– Safety from potential dangers of additional disastrous events	[ ]	[ ]
	– Protection from external threats and adverse weather conditions	[ ]	[ ]
	– Lighting and fire prevention systems	[ ]	[ ]
	– Secure storage of personal belongings	[ ]	[ ]
	– Protection from mental and physical violence	[ ]	[ ]
Health	– Proximity to local medical centres for urgent care	[ ]	[ ]
	– Psychological counselling to respond to trauma, grief, and stress	[ ]	[ ]
	– Appropriate sanitation, bathing, and laundry facilities	[ ]	[ ]
	– Access to potable cold and hot water, garbage, and waste management services	[ ]	[ ]
Comfort & Privacy	– Privacy for individuals and family units	[ ]	[ ]
	– Basic furnishing for daily life needs (e.g., for sleeping, meals, and relaxation)	[ ]	[ ]
	– Control of light, ventilation, and heating to provide appropriate level of indoor quality	[ ]	[ ]
Cultural & Special Needs	– Safety: Handrails that facilitate ease of movement for the elderly and people with disabilities.	[ ]	[ ]
	– Accessibility: Accessible living spaces for the elderly and people with disabilities, e.g., lifts, ramps, and widened passageways for wheelchairs etc	[ ]	[ ]
	– Culturally appropriate facilities in both private and public spaces	[ ]	[ ]
	– Maternity: Pregnancy and breast-feeding facilities	[ ]	[ ]
	– Children: Appropriate and sufficient play areas/rooms and equipment/toys	[ ]	[ ]
	– Animals and Pets: A space for pets separate from living spaces	[ ]	[ ]

		E&STA	TH
Community & Connection	– Accessible disaster recovery hub, providing registration desk and offices for financial, social welfare and other support and information services	[ ]	[ ]
	– Visually accessible signage and communication modes for hearing- and sight-impaired people, the elderly, and non-English speakers– Reliable telephone and internet services	[ ]	[ ]
	– Related to location and proximity to family and neighbourhood connections	[ ]	[ ]
	– Community meeting and recreation facilities	[ ]	[ ]
	– Access to religious services and support	[ ]	[ ]
	– Arts and related events to foster social cohesion	[ ]	[ ]
Social & Technical Support Services	– An individual, relationship-based service that supports recovery and strengthens capacity.	[ ]	]
	– Facilitate holistic supports including rebuilding advice, material needs, psychosocial support, financial assistance, any other services required in recovery.	[ ]	[ ]
	– The service is free, voluntary and accessible.	[ ]	[ ]
	– Service delivery is locally-driven.	[ ]	[ ]
	– The service is linked into the broader recovery processes for the community.	[ ]	[ ]
	– Service delivery is flexible and responsive and provides continuity of care.	[ ]	[ ]
	– The service will enable sustainable, natural support system for communities by focusing on capacity building opportunities based on community needs.	[ ]	[ ]

Figure 7: A checklist of principles of leading practice in temporary housing based upon the concepts of habitability and *communitas* (Note**: E**&STA – Emergency and Short–Term Accommodation / TH – Temporary Housing)

4

TEMPORARY HOUSING OPTIONS FOR RESILIENT RECOVERY

To date, a . . . solution to the problem that is low–cost, quick to construct, environmentally and socially sustainable, takes into account the needs of the occupant, and accounts for local climatic conditions has not been found. On the contrary, every major disaster proved the inability of governments to cope with the challenges posed with providing for the large numbers of displaced peoples.[47]

4.1 Introduction

This chapter addresses appropriate models or forms of temporary housing. The range of forms used across all post-disaster housing phases in Australia is outlined but the major emphasis is on the options available to housing recovery agencies for people displaced for significant periods of time, e.g., beyond the first four months after displacement. This is the period termed "Temporary Housing" in Figure 5.

Despite significant housing shortages in Australia, especially for private rental accommodation, varied options are currently in use to house displaced people during and in the few weeks after a disaster, i.e., in Emergency and Short-Term Accommodation phase of recovery. These may include staying with family or friends or sheltering in an emergency, or relief centre for a period of days/weeks. (see Figure 6).

After that, people who still require short-term shelter may be accommodated in caravan parks, camp sites, hotels/motels, college and school dormitories, youth camps, army barracks, etc. Adopting construction systems often used to accommodate fly-in fly-out workers in remote mining locations, Manufactured Housing Units (or "pods") seem to be increasing in use as seen in the use of Minderoo Pods in northern NSW and similar at the Gympie Recovery Accommodation Park (GRAP) in SE Queensland after severe flooding in early 2022. Former COVID facilities such as Howard Springs in the Northern Territory and the Centre for National Resilience at Mickelham, Victoria, have also been used for Emergency and Short-Term Accommodation.

However, people still unable to return to their homes or find alternative housing after a period in Emergency and Short-Term Accommodation face significant challenges. The housing recovery agencies that support them also face significant challenges as the tight housing market in Australia has reduced the availability of rental properties and undermined the capacity of the mortgage and construction industries to meet the demand for increased housing supply.[48] This problem is so severe that a team of seven leading Australian housing professors argued that government agencies are "ill-equipped to aid people in times of calm, let alone following a disaster".[49]

Issues particular to post-disaster housing also challenge the ability of agencies to support displaced people with Temporary Housing. These include delays in obtaining planning and building permits to rebuild or renovate damaged houses, insurance and under-insurance related issues, and extensive delays due to stronger building codes and possible land rezonings to prevent rebuilding in highly disaster-prone areas.[50] Another key factor is the need to ensure that housing recovery reflects the principles of building back better[51] and that the wider processes of economic, social, cultural, and environmental recovery are mutually reinforcing, with housing recovery playing a key part in this and is supported by them. This is the process of resilient recovery. The characteristics of resilient recovery are outlined in the next section.

However, first, notice should be taken of the challenges to resilient recovery posed by the problems resulting from current short-term and interim housing practices, for example:

- People on rural properties living in caravans parked on their land for many months and, even, years.

- Finding sufficient and adequate housing for vulnerable groups, such as renters, homeless people, people with disabilities

- The stresses and family disruptions attributable to staying with extended family and/or in small spaces for long periods of time.

- The non-use of local building materials and labour in providing temporary and stable housing.

- The delays in housing people caused by relocating pods and other manufactured housing units over great distances.

- The costs attributable to storing pods and modular units after they are vacated and awaiting reuse in a later, inevitable, and distant disaster.

Such issues emphasise the need for resilient recovery.

4.2 Towards Resilient Recovery

Post-disaster housing recovery is fraught with the same semantic problems as the terms to name the specific types and phases of housing after a disaster. Historically, recovery has been *ad hoc* and largely in the hands of the private sector, including homeowners, banks, insurance companies, and developers. As a result, in countries such as Japan, USA, New Zealand, and Australia, which are characterised by high levels of asset insurance, medium- to long-term recovery has tended to be on a house-by-house, building-by-building basis.

However, this situation can limit the timeliness and effectiveness of recovery in at least three ways:

1. Recovery is delayed by households having to deal with insurance companies and local planning authorities on an individual basis, with insurance claims and building approvals often taking inordinately lengthy periods of time.

2. The reluctance of governments to use their powers of eminent domain (until very recently) has restricted the development and application of comprehensive plans to rebuild in ways that address the root causes of a disaster, e.g., planning regulations that allow residential housing on flood plains.

3. It has limited thinking about recovery to the processes of rebuilding (or "replacement recovery")[52] rather than wider social and economic reconstruction and environmental or what has been termed "resilient recovery"[53] or "holistic recovery".[54]

These challenges to resilient recovery are a particular problem in Australia, where nearly 70 per cent of people live in privately-owned or mortgaged homes. Most of the remainder live in private rental accommodation. Significantly, only 3.8 per cent of people live in social housing, a figure that declined by nearly 25 per cent between 1981 and 2021.[55] This privatisation of housing – whether to homeowners or landlords – intensifies the barriers to resilient recovery due to time and cost factors related to planning and insurance issues that result in an emphasis on "replacement recovery". As a housing research team from the University of Melbourne argue, the problems in adequately meeting post-disaster housing needs, and we can add the wider needs of resilient recovery, "is an unintended consequence of leaving housing to the market system".[56]

While housing is predominantly a private good in Australia, the economic and social benefits of housing recovery justify high levels of government planning, social support, and investment.[57] Government support for people displaced from their homes by disasters is especially important when households are poor and lack access to insurance or other resources for recovery.

As a result, the World Bank states that even *in the context of housing recovery*, it is "not just about houses"[58] as resilient disaster recovery involves "restoring the physical, socio-economic, and mental conditions of a society to a state of . . . greater safety, more secure economic prospects and a more stable, healthy, happy society".[59] Similar features of resilient recovery are outlined in a Discussion Paper prepared for the Victorian Resilient Recovery Strategy:

> Resilient recovery connects community systems and networks to plan for and support wellbeing, liveability, sustainability, viability, and community connection outcomes for a safer and more resilient future. A resilient recovery supports individuals, families and communities to be healthy and safe, engage in and lead their recovery, to be able to live, work and connect within their community and to identify opportunities for growth, renewal and innovation. . . . [It] is community focused and driven. It focuses on supporting wellbeing, liveability, sustainability, viability, and community connection outcomes aligned with community needs. [60]

The four principles of wellbeing, liveability, sustainability, and community connection (Figure 8) underpin resilient recovery and cohere with the dimensions of habitability and *communitas* outlined in Figure 7. The principle of *viability* in resilient recovery is significant as temporary housing is among the most complex and costly issues for governments after a disaster. Indeed, long-term housing recovery is dependent on the financial resources needed for repairs or new construction.[61] However, issues related to post-disaster housing costs have generally been overlooked by researchers.[62] Nevertheless, issues of cost-efficiency and the timeliness of housing delivery do need to be balanced with the principles of wellbeing, liveability, sustainability, and community connection – and strategies are available that can achieve this.

Understanding the economic and financial dimensions of housing recovery is essential for successful long term community recovery. The comprehensive analysis of the costs involved in various housing recovery strategies, from initial construction to long-term maintenance, is necessary to understand the financial implications of recovery and to identify the most cost-effective methods. Funding mechanisms, including government funding, insurance claims, and private investments, play an important role in implementation and sustainability of these strategies. The economic impact of housing recovery extends beyond direct costs, influencing local labour markets, the construction industry, and the overall economic stability of affected community/region. Having a competent

understanding of economic considerations is integral to formulating resilient and sustainable recovery strategies that align with community needs in line with available resources at the time.

Incorporating land-use planning strategies that prioritise disaster risk mitigation is also essential for enhancing the resilience of temporary housing solutions. This involves adopting zoning regulations and building codes that consider local disaster risks. Regulating land use in areas susceptible to specific disasters, such as flood or bushfire, notably mitigate potential damage. Revising building codes to ensure that structures in high-risk areas are resilient to anticipated disasters is also important. Land-use planning should be part of a broader disaster preparedness and response strategy, ensuring temporary housing is safe, resilient, and strategically located. In Australia's multicultural context, land-use planning must involve active community engagement. Understanding the diverse community needs helps develop housing strategies that are resilient and culturally sensitive. Incorporating Australian case studies on land-use planning related to housing recovery can guide policy development and reform. These examples should focus on specific challenges and innovative solutions.[63]

In addition to these principles, an essential aspect of resilient recovery is the integration of temporary housing strategies with the restoration and strengthening of critical infrastructure and essential services. This integration is vital to ensure that temporary housing is not only physically safe but also functionally viable, providing residents with essential utilities and connectivity. The recovery from disasters should be seen as a multi-faceted process, where housing recovery efforts are linked with broader strategies for infrastructure and community recovery. This approach helps prevent isolated efforts and promotes a more efficient and comprehensive recovery. Choosing and designing temporary housing locations ought to prioritise resilience to future disasters. This involves considering factors such as proximity to reliable infrastructure, potential hazards, and ease of access to transportation and essential services. While focusing on infrastructure and services, the human element of recovery should not be overlooked. Engaging with communities in the planning process ensures that temporary housing solutions are technically, socially and psychologically supportive. Analysis of past disaster recovery efforts, particularly in regions that have similar characteristics and/or challenges to those currently being addressed, can provide valuable insights into effective strategies for integrating housing recovery with infrastructure restoration. These case studies can serve as models for developing tailored approaches that address the unique challenges of different communities.

In line with such thinking, the Victorian Discussion Paper concludes that resilient recovery is an approach that "*changes the focus of recovery*" because current agency and private sector led processes "often limit or direct community outcomes rather than support and enable them".[64]

4.3 Changing the Focus of Housing Recovery

Despite demands to change the focus of housing recovery, much research aimed at uncovering innovative ideas for post-disaster housing has focused on individual aspects of recovery not comprehensive resilient housing recovery. These specialist topics include studies related to evacuation modelling, algorithms to find the best sites for emergency shelters, recovery planning that does not include housing issues, sustainability in shelter performance, and the architectural design of emergency shelters – with designs ranging from modern version of WW2 Nissan and Quonset huts to retrofitted shipping containers, cardboard log houses, igloos, and a range of flat-pack solutions.[65] Almost all of such research reflects a "recovery by replacement" approach, not resilient recovery.

Figure 8: Principles of resilient recovery[66]

Such studies are valuable in their own way but the solutions they offer do not reflect thinking outside current paradigms or systems of post-disaster housing. In particular, their tendency towards universal solutions fails to recognise the need for contextual relevance demanded by the community focus and human rights foundations of newer approaches to resilient housing recovery. Thus, recommended innovations based upon such research fail to appreciate the varying needs and aspirations of disaster survivors or to respond flexibly to the vastly different socio-economic and political contexts of the different locations, types, and severity of different disasters They also fail to consider the principles of habitability, *communitas*, and economic viability that underpin the innovative foci of resilient housing recovery.

The US experience

Key lessons relevant to the changes in approach required for resilient housing recovery can be learnt for the new paradigm of housing recovery emerging in policy and practice in the USA. Such reforms have arisen from a growing recognition of the high economic costs and social problems caused using FEMA trailers and related Manufactured Housing Units (i.e., or factory-built shelters) as temporary housing in the few months' period between emergency sheltering and the provision of medium- to longer-term temporary housing. However, many people have remained in FEMA trailers for several years with FEMA even selling them second-hand to inhabitants who find them the best (or least bad) option available in their particular circumstances.

However, numerous problems related to high levels of social and family disfunction became evident after the mass roll-out of MHU following Hurricane Katrina in 2005. These included changes in the quality and cohesiveness of relationships among household members; increased conflict and domestic violence; and mental health problems related to trauma, grief, and the uncertainties of the recovery process.[67] Such issues were particularly severe when the residents of Manufactured

Housing Units (MHUs) were congregated in villages. One report, described the trailer homes and parks as "social wastelands filled with criminal elements and other undesirables" and "as a major threat to the safety and quality of life of the local communities in which they are situated" not to mention the safety, health, and quality of life of the displaced people themselves.[68] On top of this, poor indoor air quality from emissions of formaldehyde in the construction materials, low ceilings, and a lack of ventilation led FEMA to seek to evict people from the "toxic trailers", further exacerbating the problems of Katrina survivors, most of whom were extremely poor.[69] Similar problems with the predominant usage of MHUs and other forms of short-term housing have been identified after other hurricanes, floods, wildfires and earthquakes in the USA.[70]

The Australian experience

Australian housing recovery agencies have only recently begun to pilot MHUs for Emergency and Short-Term Accommodation although NSW has used them for up to two years. MHUs are often referred to as "pods" in Australia and have often been despatched and installed with philanthropic assistance from mining companies who used such units for fly-in fly-out employees. These include the use of pods (Minderoo Pods) after bushfires (2019-2020) and floods (2022) in NSW; the 2019-2020 fires on Kangaroo Island, South Australia; and at the Gympie Recovery Accommodation Park in Queensland following severe flooding in 2022. The National Emergency Management Agency has recently announced that Australia's first National Emergency Management Stockpile will include a supply of Humanihut MHUs sufficient to shelter over 700 displaced people and 1400 emergency personnel.[71] Instead of MHUs, the Short-term Modular Housing (STMH) Program in Victoria deployed prefabricated housing modules after the 2019-2020 bushfires in eastern Victoria.[72]

Several of these programs have been evaluated and found to be reasonably successful. These evaluations indicated that the provided accommodation units contributed towards resilient recovery by providing a place in which to live on a family's own land and to attend to local recovery efforts, monitor house rebuilding, and network with local community members. Figure 9 provides evidence of this from the NSW and Victorian evaluations.

In this changing landscape, it becomes increasingly important to consider how temporary housing solutions can transition into permanent, sustainable communities. This transition is central to ensuring that resilient recovery extends beyond immediate relief and considers the long-term stability and well-being of affected communities. The complexities of the diverse multicultural social dynamics that is the Australian context demand comprehensive community engagement strategies. These strategies should include active participation from community groups, fostering an inclusive transition that accommodates varied cultural needs and addresses the social and psychological impacts of displacement.

Moreover, the focus on making temporary housing solutions a stepping stone to stable and sustainable community living involves considering the environmental, economic, and social aspects of sustainability in housing design and location. This approach would create adaptable, environmentally responsible housing solutions that also contribute to the economic stability and social cohesion of different regions. By integrating steps to transition from temporary to stable housing into broader disaster recovery planning ensures that interim housing solutions are not just immediate shelters but initial steps towards sustainable housing developments and resilience. This point is developed further in Section 4.5.

Temporary Accommodation Recovery Pod Program (TARPP) NSW following 2019-2020 Bushfires	Victorian Short-Term Modular Housing Program (STMH), Eastern Victoria following 2019-2020 Bushfires
• 239 households across NSW were provided with a temporary Recovery Pod following displacement, which enabled them to **live locally and attend to work, education, as well as undertake house repairs, renovations, or rebuilding.**	• 278 primary places of residence were uninhabitable due to bushfire in a region that was experiencing housing pressure prior to the bushfires.
• Within 24 months, the program was on track to achieve the long-term goal of stable housing for all but 36 households for whom rebuilding has not commenced or is unlikely to happen.	• 68 received a prefabricated modular STMH unit on their own land as a bridge between emergency accommodation and the longer-**term rebuild** of the homes at a cost of $150,000 for construction and installation.
• The most common responses to 'how' the program supported recovery was that it allowed people to be on their properties and **benefit from the local connections that supported them through their economic and housing recovery**.	• STMH achieved **a high level of satisfaction and residents reported improvements in wellbeing.**
• There was less agreement that the program was assisting with social recovery outcomes, with little more than half agreeing that this was the case (in reference to the community and connectedness elements).	• **Reconnecting to one's** property was highly valued due to being on site to care for animals, continue the clean-up, oversee rebuilding, and **be part of a community**.
	• Contextual factors hindered recovery and rebuilding, including COVID, remoteness, rebuilding and material costs, and labour and skills shortage of builders, and personal factors related to trauma and insurance issues

Figure 9: Examples of steps toward resilient recovery in two Australian case studies of post-disaster short-term modular housing[73]

As noted above, NSW has utilised Manufactured Housing Units ("pods") for up to two years. **However, their small size and generally spartan style means that they are not ideal for stays longer than a few months despite the contributions to resilient recovery they can make.** Problems associated with their use include their lack of habitability factors (see Figure 4) and the costs of installation and then removal once people vacate them, maintenance and storage (stockpiling), and then transport and installation for use at sites of future disaster events. Such costs may be tolerated for "pods" due to their smaller size, lower costs of initial procurement, and opportunities for philanthropic contributions (e.g., from the Minderoo Foundation) have been possible.

Another significant problem reflects the maxim learnt from many post-disaster housing reviews. This is that all decisions made for emergency and temporary housing "have substantial implications for long term recovery"[74] This is because **the more funds expended on emergency, short-term, and temporary housing, the less funds there are likely to be for longer-term and stable housing solutions.** For example, the USA expended $US450 million on temporary housing in 2017 alone.[75] Thus, an Australian-led Delphi study of humanitarian housing practices found that they "too readily neglects longer term recovery and resilient-related goals in favour of short-term achievements".[76]

A consequence of such arguments is that efforts should be made to reduce recovery agency spending on Emergency and Short-Term Accommodation and to ensure that Temporary Housing can be transitioned easily into long-term stable housing.

There are two major implications of this:

1. Post-disaster housing planning needs to begin as one of the central strategies of pre-disaster resilience building and the reduction of the impacts of disasters.

2. Prefabricated housing should be seen as a process of transitioning Temporary Housing into on-site Stable Housing.

These two implications are two of the major innovations in post-disaster temporary housing in the USA and are discussed in the next two sections as steps on the path to resilient housing recovery.

4.4 Pre-Disaster Planning for Post-Disaster Housing

Preparing disaster recovery plans ("precovery") involves the development of processes and protocols in place for recovery and reconstruction. Indeed, "the more recovery issues that can be thought through in advance, the greater the efficiency and quality of post-disaster decision-making, which will then lead to more resilient community recovery."[77] Substantial work has been done at national, State/Territory, and even local government levels in Australia (and internationally) to achieve this. However, much less work has been done on pre disaster planning for *housing recovery*. In the USA, FEMA prepared a National Disaster Housing Strategy in 2009 (currently under review) and an Implementation Plan in 2010.[78]

The latter recommended that State and local governments cooperate in developing post—disaster housing plans pre-disaster while the Department of Housing and Urban Development (HUD) produced a three volume guide on strategies and tools for preparing such a plan in 2012.[79] Numerous State, city and county disaster housing plans have been developed as a result. Australian States/Territories are also developing these also although there is little discussion of this at local government level as yet.

However, local government involvement in pre-disaster housing recovery planning is essential, as planning for housing recovery can enable local officials to use the windows of opportunity after a disaster to integrate hazard mitigation and climate adaptation into the recovery process. Also, local authorities know local rental housing markets, places of housing refuge, and the scope and locations of homeless, disabled, elderly and other vulnerable people in their neighbourhoods.

In 2018 and 2019, the Texas Legislature passed bills that encourage and support local cities and counties to develop their own pre-disaster housing recovery plans tailored to their unique geography and demographics in order to "support communities to recover more quickly post-disaster as well as rebuild in ways that can reduce future disaster risks".[80] Support provisions include processes that enable draft plans to be evaluated, revised, and then approved and registered with the Texas General Land Office for adoption. This allows the jurisdiction to coordinate the housing response and for disaster recovery teams to mobilize proactively and quickly to interim and longer-term housing needs.[81]

The claimed benefits of pre-disaster planning for housing recovery include:

- Local officials and communities can better manage housing recovery activities in the aftermath of a major disaster or emergency

- Plans for housing recovery can be coordinated with other community plans and goals such as economic development and hazard mitigation

- Household are able to return to their community more quickly, thus providing ripple effects into the economic and social life of the community

- Housing repair, renovation and rebuilding is faster, thus supporting the community through the payment of rates more quickly

- Plans can be put in place to support households that may have trouble rebuilding on their own, especially those living in rental housing

- Plans can include public engagement and education processes to help manage expectations of government agencies in housing recovery as well as promote risk mitigation and insurance options that will improve community resilience over time.[82]

FEMA has provided guidelines for developing housing recovery plans in its document *Planning Considerations: Disaster Housing: Guidance for Federal, State, Tribal and Local Partners[83]*, while the Texas A&M Hazard Reduction and Recovery Center has developed guidelines to support the Texas legislation as well as an online guide and tool for evaluating the likely effectiveness of pre-disaster housing recovery plans.[84]

These resources would be valuable starting points for Australian agencies seeking to develop guidelines for State/Territory and local government son pre-disaster planning for housing recovery.

4.5 Innovative Housing Models

The second response in the USA in the need to deliver innovative models of housing recovery involved a number of pilot projects for temporary housing. These were initiated by FEMA after the catastrophic impacts of Hurricane Katrina in New Orleans and the "second disaster" caused by the problems encountered in the housing response. Pilot projects were later established more widely across the country.

Almost all of the programs deployed in the Hurricane Katrina recovery process involved the off-site construction of prefabricated, modular housing, which prior research recommended as being the most-time efficient and generally least costly approach to rebuilding.[85]

Characteristics of this form of housing include:

- All components of a house, including floors, walls, façades, roofing, stairs, corridors, utility provision, and bathroom and kitchen fixtures and fittings can be pre-built into modules and as much painting and decorating as required completed off-site.

- The modules are generally mass-produced in a quality controlled factory, thus providing economies of scale, high quality and sturdy production, and time savings compared to on-site construction.

- Modules can be pre-engineered and constructed to suit climatic conditions.

- The design and dimensions of modules can be flexible and are generally limited more by local rules for transporting long and/or wide loads and overpass height restrictions than by the dimensions of the module.

- On-site work to complete a building is minimal, chiefly comprising the installation of posts and base framing, securely fixing the module to this base, and connecting utilities.

- If not intended to be permanent, modules can be removed for future reuse.

- If intended to be permanent, modules can be renovated as needed and, when funding permits, additional modules can be added to expand the small dwelling into a house that suits a family's needs and aspirations.[86]

Numerous case studies of the ways in which these characteristics of modular housing have been conducted[87] and assessments of early efforts under these pilot programs indicated levels of success that encouraged FEMA and HUD to continue the programs.[88]

The RAPIDO model: A two-phase strategy

Among the many models for post-disaster housing that have been documented, the RAPIDO program in Brownsville, Texas, stands out as relevant to conditions in Australia, where there are similar priorities for disaster housing, e.g., to minimise the time spent in Emergency and Temporary Accommodation Housing, reduce the funds expended on temporary models of housing, and assist people, especially the vulnerable, transition into stable accommodation.

Led by a design NGO (Building Community Workshop or bcWorkshop)[89] and supported by housing and community development NGOs, the RAPIDO model arose from frustration with the shortcomings of then-current models disaster response, "such as the amount of money spent on temporary emergency shelter, the delays experienced by families and individuals waiting for recovery funds, as well as the amount of time spent redesigning the wheel after a disaster hit".[90] Instead, the RAPIDO coalition has developed **an integrated approach to housing recovery that aims to facilitate resilient housing recovery from disasters within four months instead of years**, and which has spread from Brownsville to other towns and cities in the Rio Grande valley.[91]

As illustrated in Figures 10 and 11, RAPIDO seeks to achieve this through three platforms:

- Public-Private-Community partnerships for planning, management, and resourcing;

- Pre-disaster housing recovery planning, based upon:
  o Extensive engagement both before and after a disaster with the people most likely to be impacted (i.e., vulnerable groups)
  o Community and land mapping to create data sets on demographics, topography, existing housing needs and overall strategy
  o The development of guidelines and technical manuals and associated community, industry, and agency capacity building

- A high quality and rapid response prefabricated modular housing system based upon the collected and processed pre-disaster knowledge applied to the goal of household and regional economic recovery through housing.

The key to meeting this goal is the construction of an attractive but simple 480 sq ft (45 sq m) "CORE" modules that contains essential facilities, such as a living area, kitchenette, bathroom, and sleeping area/s. CORE modules are built locally, transported by basic trailers, and assembled on-site in three days by four people.[92] Construction may occur either before a disaster and stockpiled or, as needs and quantities arise, shortly after a disaster. If the latter, participating households can choose from a small range of design options to customize the details and characteristics of their new home to make it as functional as possible for their family. This has been found to be an important opportunity for displaced people to exercise agency at a time of extreme stress. The RAPIDO model also features a progressive or "temporary-to-permanent" construction strategy that allows CORE modules to be duplicated or expanded, once conditions have stabilized.

Disaster Declaration

> Implement the DRH Program.

> Recovery and Response Briefing.

> Perform damage assessment with support from the Local Disaster Planning Board.

> Incorporate outside groups and agencies into the DRH program and Action Team activities.

Design

> Evaluate the pre-disaster construction work and the material available.

> Gather the Design Action Team.

> Prepare for the home design selection process.

> Designer and Navigator inform the family of the move-out time frame.

Follow up

> Review disaster recovery and develop recommendations.

> Construction follow-up.

> Review the DRH program and develop recommendations.

> Update the local jurisdiction's DRH plan.

POST DISASTER PROCESS

PHASE 1

PHASE 2

PHASE 3

PHASE 4

PHASE 5
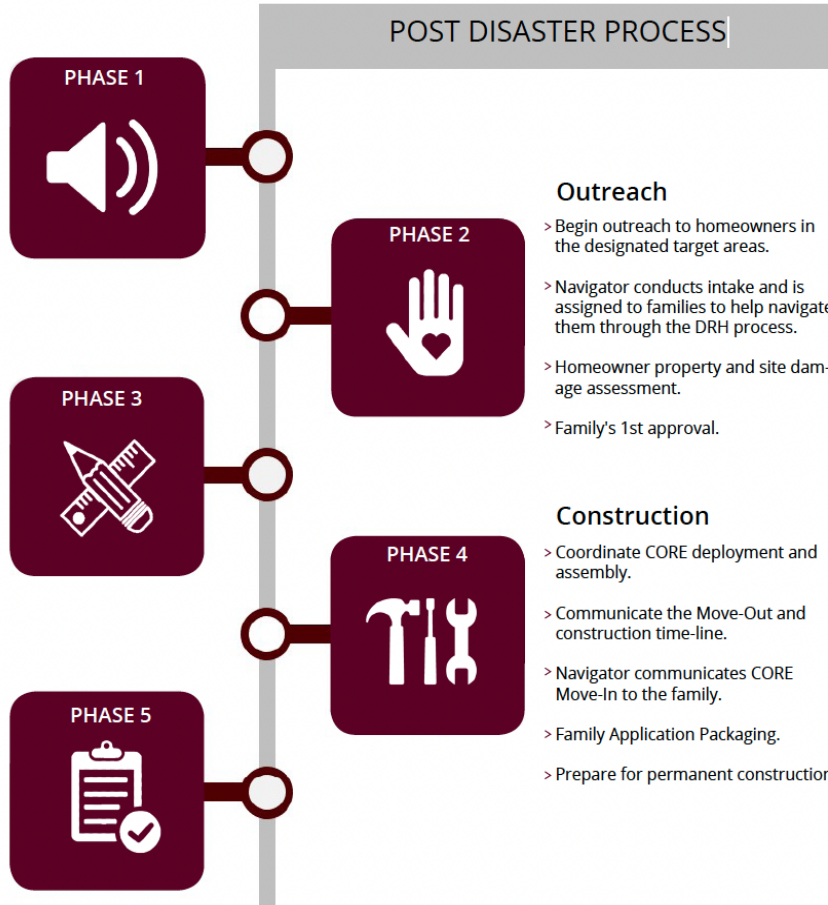
Outreach

> Begin outreach to homeowners in the designated target areas.

> Navigator conducts intake and is assigned to families to help navigate them through the DRH process.

> Homeowner property and site damage assessment.

> Family's 1st approval.

Construction

> Coordinate CORE deployment and assembly.

> Communicate the Move-Out and construction time-line.

> Navigator communicates CORE Move-In to the family.

> Family Application Packaging.

> Prepare for permanent construction.

Figure 10: The RAPIDO planning, engagement, design, construction, and review process[93]

DAMAGE ASSESSMENT

How is it conducted ?

Damage assessment is the appraisal that is performed after the disaster in order to determine the amount of damage that an area has received. The damage assessment identifies 'substantial damage', or structures or properties where damage is greater than its actual value.

OUTREACH

Identifying vulnerability

Outreach is the activity of identifying populations that will need funding assistance to rebuild homes following the disaster and is the practice of conducting local public awareness activities through targeted community interaction. The point of outreach is to identify eligible aid recipients and enroll them in the program to receive housing recovery assistance.

CASE MANAGEMENT

Communication

Navigating through the complex bureaucracy of obtaining funding assistance for housing is a challenge for individuals and families. The role of the case manager is to walk disaster victims through an eligibility process to determine and funnel funding assistance and resources to victims. The relationship between the disaster victim and their case manager revolves around resource availability and knowledge.

DESIGN DECISION

Community acceptance

The design of the home is a critical component to a housing recovery program. Reconstruction efforts should take into consideration short-term and long-term needs of residents. A sustainable design solution must not only work to provide for a rapid transition from temporary housing to permanent housing, but should also be adaptable to the future needs of households.

CONSTRUCTION DECISION

Building & zoning codes

The construction process includes permitting and inspections, the procurement of materials, and the construction of homes. Solutions like the one proposed in this program, which are intended to transition from a temporary to permanent housing solution, must comply with zoning and building code regulations.
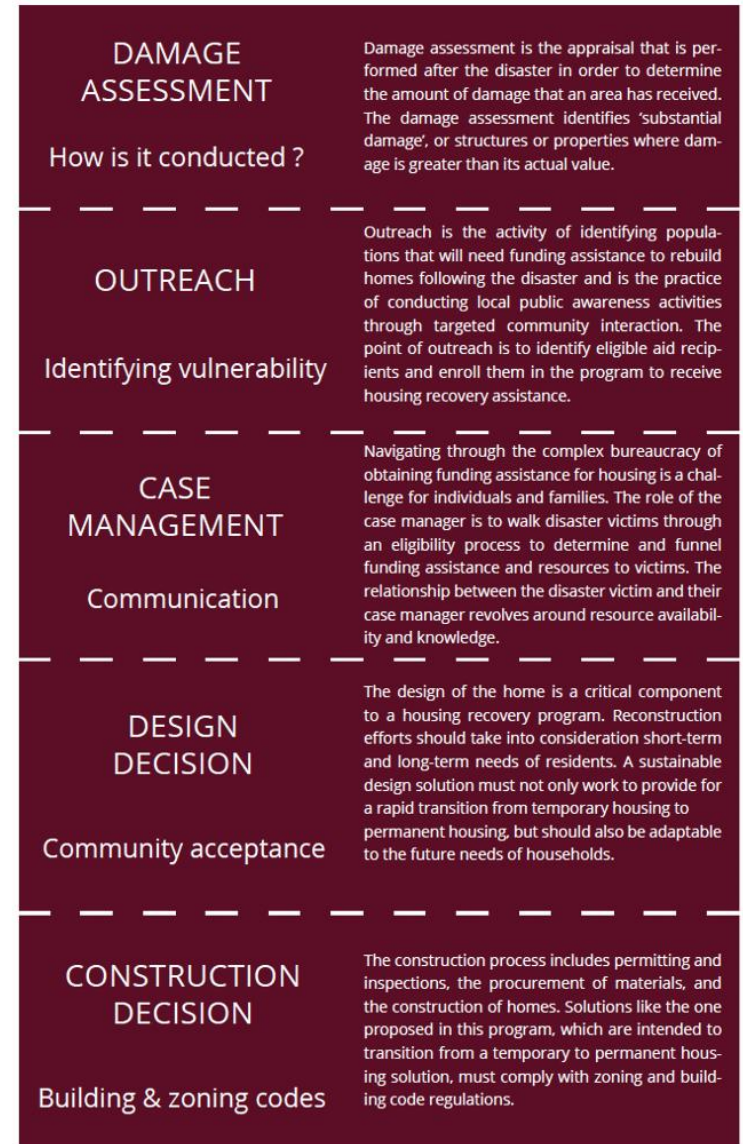
Figure 11. Decisions in RAPIDO resilient housing recovery[94]

This two-phased construction strategy allows displaced families to receive and live in a CORE module or *Phase* 1 *home* that contains essential living facilities. When resources and time allow for expansion, RAPIDO homes can be expanded into a *Phase 2 home* (see Figure 12). Between Phases 1 and Phase 2, families receive a catalogue to help guide their thinking about Phase 2 options. Their choices are supported by individual design consultations that enable families to personalize their space to meet family needs and aspirations. In this way, RAPIDO also helps to avoid "cooky-cutter" streetscapes by creating neighbourhoods of varied housing and visual interest as well as contributing to housing recovery.

CORE modules cost around $US70,000, which is comparable in price to a temporary FEMA MFU for families to live in while their homes are being rebuilt. Instead of using such disaster funding to purchase temporary MFUs, that will eventually be moved on, RAPIDO builds the initial CORE units as first stage of a two-phase housing system. Families are later able to leverage insurance claims, household mortgages, and/or HUD housing assistance to finance a Phase 2 expansion. The displaced families who owned their houses previously continue to own the land now have a new, better quality, home. Families that were uninsured or do not qualify for mortgage finance are "gifted" the CORE unit debt free. This is because the cost of their CORE module is about the same as governments would have spent on a disposable temporary dwelling. As a result, RAPIDO not only provides higher-quality housing faster than FEMA's temporary approach but is also leverages existing funding channels to provide families with an asset as a foundation for future wealth.

RAPIDO is just one of the growing number of successful pilot projects for innovative housing models in the USA.[95] Space does not permit a detailed coverage of them but mention should be made of New York City's SCALE (Sustainable Contemporary Adaptive Living Environment) model for using shipping containers for the rapid delivery of single storey houses and medium-rise and multi-family apartments following a disaster (Figure 13).[96] Still at the pilot stage, SCALE is the outcome of New York's Urban Post-Disaster Housing Prototype Program that is aimed at procuring well-designed post-disaster housing suited to a central or near-central city location. SCALE uses modified shipping containers to provide rapidly deployable, high-quality housing in the event of a disaster that displaces large numbers of people. This is another rapidly deployable option for Australian agencies to consider for post-disaster housing needs in densely populated cities.

An important element to these innovative housing models in shaping future housing strategies involves understanding climate change projections and appropriate adaptation strategies. As climate patterns shift, leading to more frequent and severe disasters, it is essential to integrate climate change projections into the planning and development of temporary and stable housing solutions. This requires a proactive approach to understanding how future climatic changes, such as increased frequency of extreme weather events, rising sea levels, and changing temperature patterns, will impact disaster-prone areas. Adaptation strategies should focus on constructing resilient housing that can withstand these changes, utilizing sustainable materials and designs that account for future climatic risks. By incorporating these climate change considerations, housing recovery strategies can be more effectively aligned with long-term resilience goals, ensuring that communities are better prepared to face the challenges of an evolving environment. This approach will not only provide immediate relief post-disaster but also contribute to the sustainable and resilient development of communities in the face of climate change
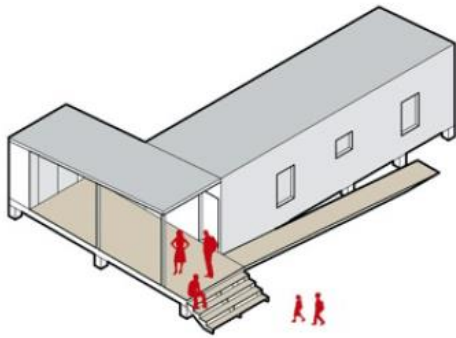
FAMILY LIVES IN THE CORE

Families receive a standardized "CORE" home that contains essential living facilities, families will reside in the CORE during four months until the eligibility process is completed and resources are allocated.
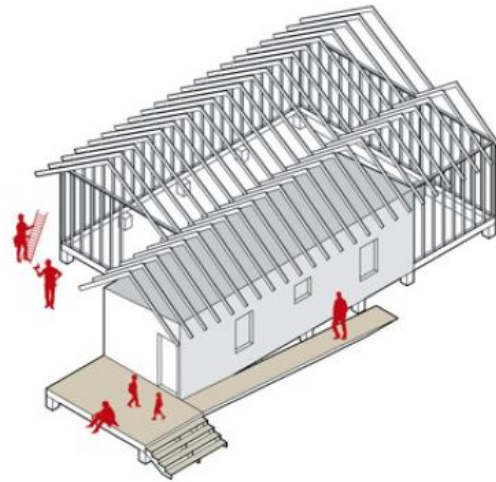
CORE IS EXPANDED TO FIT FAMILY'S NEEDS

When time and resources are available the CORE gets expanded into a permanent home. Families participate in a one-on-one design consultation to choose floorplans and home designs that can meet their needs and preferences. The CORE additions are built in 60 days.
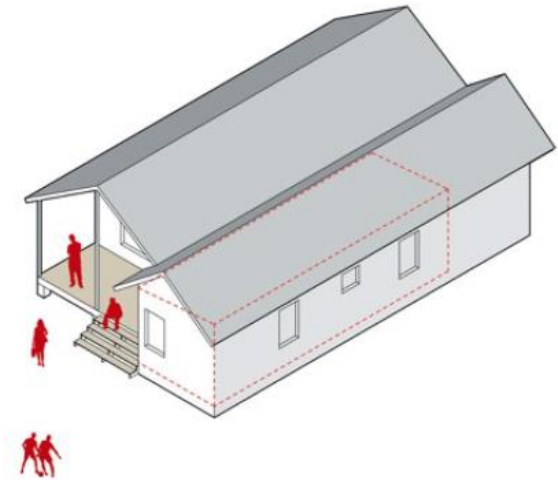
FAMILY ENJOYS HOME

The temp-to-perm approach together with the engaged design process results in home designs that increase the pride and ownership feeling. This process increases the variety and quality of home designs available after a disaster ensuring families will be better prepared for the next disaster event.

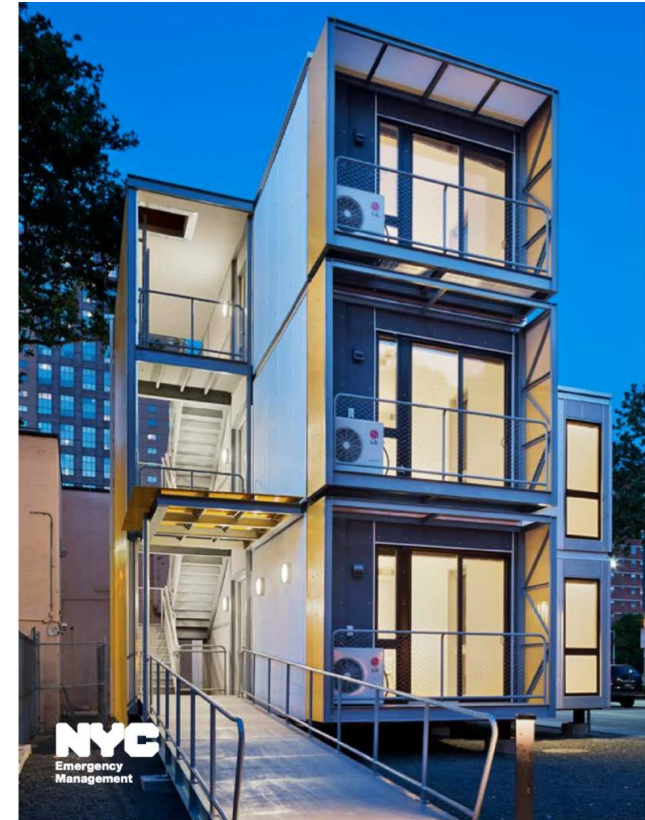Figure 12: RAPIDO's two-phase progressive housing model [97]

Figure 13: New York City's SCALE (Sustainable Contemporary Adaptive Living Environment) model using shipping containers for the rapid delivery of post-disaster housing[98]

4.6 Implications for Australia

Australian housing recovery agencies are at the point where, despite the ever-present need for additional resources, strategies are in place to provide for Emergency and Short-Term Accommodation and as shown in Section 4.3, independent evaluations are now beginning to be undertaken to learn from current projects and improve upon them.

The challenge now is to develop cost-efficient and effective programs for Temporary Housing that can facilitate the transition to stable housing.

Figure 6 outlined the range of current options available for Temporary Housing, *viz.*:

- Caravans on private property or public land
- Villages of existing or modular units
- Modular units on private land
- Rented flat or house (state, community or privately owned)

The innovations from the USA discussed in Sections 4.3 and 4.4 provide ideas for expanding these options in Australia in ways that (i) utilise pre-disaster planning for housing recovery to improve the emergency shelter response and guide housing recovery teams in mobilising proactively for interim and longer-term housing needs; (ii) shorten the amount of time displaced households spend in Temporary Housing and even use "core prefabricated housing modules" as the first phase of stable housing; and (iii) reduce the overall costs of the transition to stable housing.

Thus, in Australia, and following the RAPIDO model in a flexible way and in designs suitable for rural and urban settings, under such a model, it could be possible that:

- A permanent prefabricated housing module of 50- 60 square metres could be provided to disaster-displaced households within 4-6 months
- It would cost the same amount as temporary modules such as in the Victorian case study in Figure 9, i.e., approximately $150,000.
- Costs could be covered by government disaster housing funds and may even be repaid by landholders from savings or their insurance coverage.
- It would contain 1-2 bedrooms, a kitchen, a bathroom/laundry, and a sitting room and be built to a high standard of structural security and a medium standard of fixtures and fittings
- Additional modules could be added when people can afford it and/or when insurance claims are paid.
- Landlords may be interested in participating in such a program as a way of responding to tenant needs and replacing damaged buildings in a cost effective and expeditious way.

Extensive advice on the practicalities of implementing such a permanent prefabricated model for housing replacement in Australia has been initiated by the Building 4.0 Cooperative Research Centre.[99]

Conditions for the adoption of such a model in Australia would need to be worked out through engagement across government, insurance and building industries, and community representatives but could include:

- Prepared and vetted plans for housing recovery at local and State/territory levels as part of wider disaster recovery planning
- Databases of local demographic, geographical and housing information for ready analysis after a disaster
- Pre-qualification of prefabrication companies and assemblers with such companies required to be vetted for financial security, standards of design, construction and fittings, strategies for surge planning should their services be required after a disaster.
- Capacity building for architects and house designers to engage effectively (and voluntarily?) with displaced families in partnership with housing recovery agencies.
- Capacity building of certified builders to supervise local residents in module installation, and of local residents to be able to be so engaged.
- The cooperation of local council planning offices, mortgage providers, and insurance companies.
- An independent program of evaluation and program revision.

4.7   Recommendations

2. Adopt common principles of leading practice in post-disaster housing recovery (Figure 8) including community connection, wellbeing, liveability, viability and sustainability, for deciding accommodation and support options for people requiring Emergency and Short-Term Accommodation and Temporary Housing.
3. The Commonwealth and State/Territory governments should extend the agreed principles of disaster recovery to include principles of resilient recovery.
4. Develop resources and guidelines to support planning and operational response for post disaster temporary housing.
5. Develop capacity building resources and programs for State/Territory agencies and local governments to support pre planning for disaster temporary housing.
6. Recognise different cost implications of temporary housing programs including indirect costs. Develop funding streams to address the priority needs.
7. Undertake research into post disaster temporary housing topics such as:
    - Improving housing resilience through land-use planning and building codes.
    - Learnings from previous disasters on suitable approaches for different communities and contexts.
    - Utilisation of innovative construction technologies, materials and methods.
    - Utilising permanent prefabricated housing modules that transition from temporary to permanent.
8. Resource, trial and evaluate a pilot program to identify ways of achieving a two-phase approach to assisting home-owners and renter households into stable housing.

5

TOWARD A FRAMEWORK FOR PLANNING AND DECISION MAKING

Presence of uncertainty during disaster events prevents clear identification of needs. Most of the response plans are multifaceted that include complex requirements of individuals and communities. Moreover, constraints are enforced on emergency managers when required resources and necessary infrastructure are not available. More deliberated and detailed response plans are required in order to reduce response time as effectiveness of the response reduces drastically with time. Housing response time is the most critical part, as delay in providing assistance leads to many consequences like community displacement and mental stress. Proposed framework would assist entities to develop a strategy that would improve their preparedness and reduce housing response time. Such strategy would not only help emergency agencies and allow them to concentrate on other emergency operations but would also accelerate recovery for individuals and their families.[100]

5.1 Introduction

The purpose of this chapter is to provide a framework through which housing recovery agencies may integrate the lessons from leading practice (Chapter 3) and housing models (Chapter 4) into the project management cycles that characterize their work.

This is an important undertaking as such a framework is needed to address the many complex and often contradictory dilemmas that face recovery agency decision makers. This need has been recognized by many researchers. For example, Ritchie and Tierney have identified that the decisions that disaster housing agencies and staff must span and integrate include diverse areas of knowledge and expertise such as governance, coordination, needs assessment, balancing alternative "goods" through trade-offs, logistics, operationalization, and evaluation.[101] At the same time, others emphasise the importance of making such decisions through evidence-based deliberation if long-term strategic objectives are to be achieved.[102] Very often, there is insufficient subsidiarity between government policy, conditions on the ground after disaster, and the information and leadership available to disaster housing staff to make effective decisions.[103] Despite such conditions, they are also seeking to be inclusive by involving displaced people in the decisions that affect them while also catering for the special needs of vulnerable and culturally-diverse groups – as the principles of habitability and *communitas* require (Chapter 3).[104]

The difficult conditions under which decisions have to be made have led to the development of decision making frameworks for managing post-disaster housing by a number of researchers and agencies. Many of these draw upon decision theory and the quantitative processes of decision science such as modelling, multi-criteria decisions making, and AI.[105]

However, detailing ways in which decision science can support disaster housing management is beyond the scope of this report although there may be value in later research on the feasibility of developing decision-making approaches such as these in Australia. This could be complemented by further research on the experiential knowledge of disaster housing managers as its own form of knowledge for decision-making or in relation to research-derived knowledge and/or decision science processes.

5.2 Dimensions of a Decision-Making Framework

A decision-making framework for managing post-disaster housing recovery needs is needed to guide disaster housing agencies in serving the habitability needs of displaced communities whilst integrating the iterative steps in project management and using the housing process as a lever for overall economic recovery. This involves aligning decisions at strategic, managerial, and operational levels, and trade-offs between issues of location (urban v rural), tenure (owning or renting prior accommodation), housing types (e.g., durable or demountable foundations), and procurement (e.g., flatpack kit v prefabricated modular houses).

Figure 14 illustrates the decision making processes involved in managing post-disaster housing recovery based upon nine decision categories:

1. Consultation
2. Pre-Disaster Planning for Housing Recovery
3. Situation Analysis after a Disaster Event
4. Recognising Cohorts of Displaced People with Different Needs and Assets
5. Identifying and Selecting Housing Model Options
6. Providing Agency Wrap-Around Support Services
7. Using Housing Decisions to Promote Local Economic and Social Recovery
8. Program design and delivery
9. Monitoring and Evaluation.

5.3 Implementing the Decision-Making Framework

It is not the purpose of this report to detail every element or factor in each decision category. However, Figure 14 provides a list of some of the factors in each category that need to be considered in decision-making on particular issues. These examples illustrate that each decision category involves the consideration of multiple factors, which have compounding impacts across other categories.

However, two decision categories (No. 2 Pre-Disaster Planning of Housing Recovery and No. 9 Monitoring and Evaluation) are detailed below as examples of the wide range of factors that influence decision-making. The factors are divided into strategic, managerial, and operational decisions, where:

- *Strategic decisions* are high-level policy and programmatic decisions that reflect wider disaster risk management and recovery planning of governments and responsible authorities.
- *Managerial decisions* are taken by senior disaster managers responsible for coordinating housing recovery, manage professional staff, budgets, and other resources, and engage with key stakeholders.
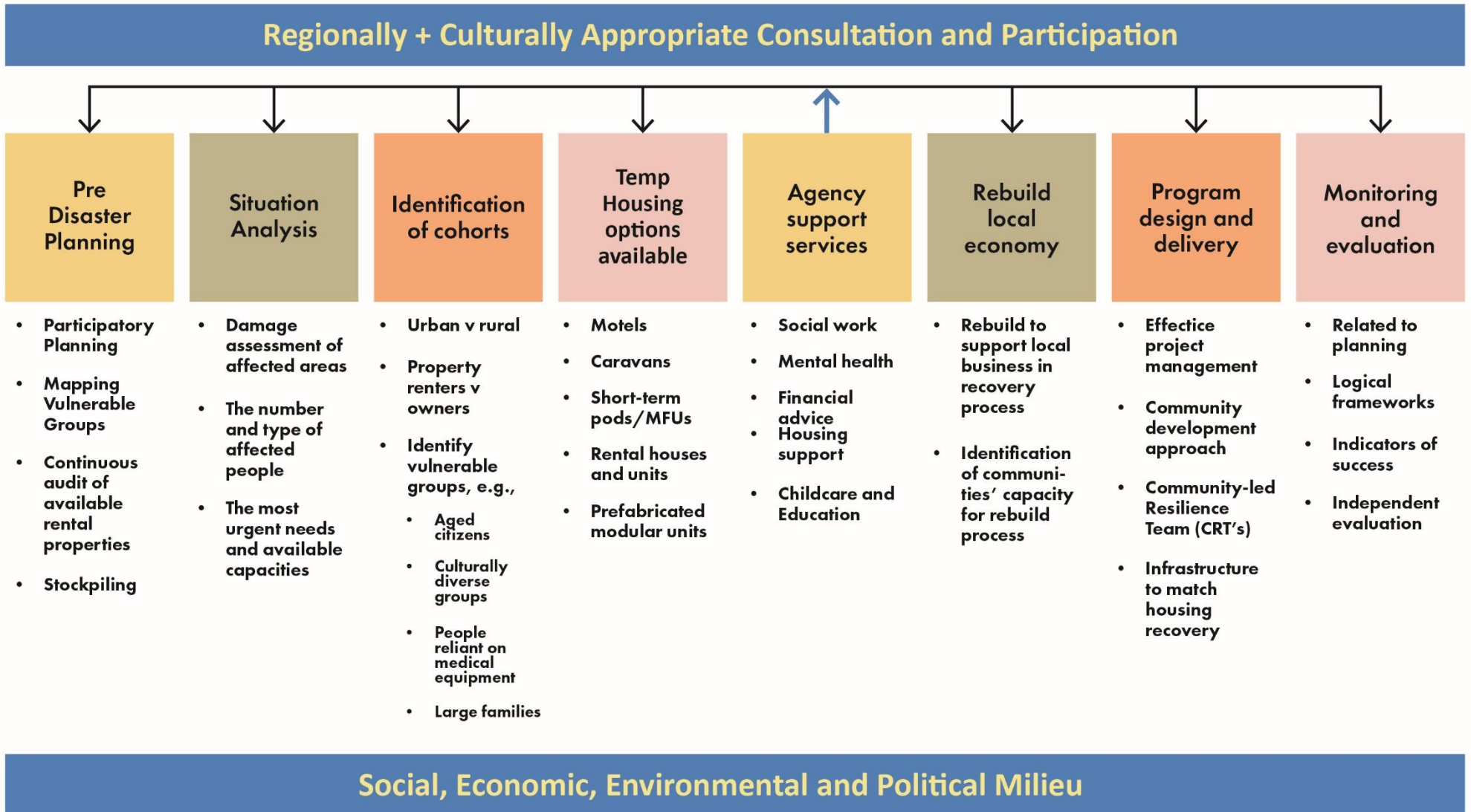
Regionally + Culturally Appropriate Consultation and Participation

Pre Disaster Planning	Situation Analysis	Identification of cohorts	Temp Housing options available	Agency support services	Rebuild local economy	Program design and delivery	Monitoring and evaluation

• Participatory Planning
 	
• Mapping Vulnerable Groups
 	
• Continuous audit of available rental properties
 	
• Stockpiling
	• Damage assessment of affected areas
	
	• The number and type of affected people
	
	• The most urgent needs and available capacities
		• Urban v rural
		
		• Property renters v owners
		
		• Identify vulnerable groups, e.g.,
		
		  • Aged citizens
		
		  • Culturally diverse groups
		
		  • People reliant on medical equipment
		
		  • Large families
			• Motels
			
			• Caravans
			
			• Short-term pods/MFUs
			
			• Rental houses and units
			
			• Prefabricated modular units
				• Social work
				
				• Mental health
				
				• Financial advice
				• Housing support
				
				• Childcare and Education
					• Rebuild to support local business in recovery process
					
					• Identification of communities' capacity for rebuild process
						• Effectice project management
						
						• Community development approach
						
						• Community-led Resilience Team (CRT's)
						
						• Infrastructure to match housing recovery
							• Related to planning
							
							• Logical frameworks
							
							• Indicators of success
							
							• Independent evaluation

Social, Economic, Environmental and Political Milieu

Figure 14: Examples of the range of factors to consider in different iterative categories of decision-making

- *Operational decisions* are situational responses that translate housing recovery plans into on-ground operations.[106]

In this three-level hierarchy of decision-making, strategic decisions provide the frameworks in which operational decisions are made so that managerial decisions are aligned with strategic ones, as illustrated in Figure 15.

Figure 15: A three-level hierarchy for decision-making[107]

Sample Decision Category 1: Pre-Disaster Planning for Housing Recovery

The importance and rationale for planning for resilient housing recovery *before* a disaster occurs were explained in Section 4.4. Thus, in terms of the decision category of Pre-Disaster Planning for Housing Recovery, these decisions could include:

Strategic Decisions

- Integration of the housing recovery plan with community visions and aspirations for the type of community they would like after recovery.

- Integration of the housing recovery plan with other plans for disaster recovery.

- Development of a charter or set of principles for housing recovery, e.g., housing rights, the primacy of resident choice, expectation management, transparency, and accountability.

- Principles for determining the degree of top-down v bottom-up recovery processes to be utilised regarding types and phases of housing.

- Principles for balancing contradictory priorities, e.g., rapid rehousing of displaced people v. the longer time building back better, safer, and stronger may take; and the degree of balance between individual and community housing needs.

- Resources available for prior procurement and stockpiling of units for emergency and short-term housing.

- The desirability of strategies for integrating interim and medium-term prefabricated modules into a two phase progressive housing strategy.

Managerial Decisions

- Processes for coordinating across government, business and community leaders and stakeholder groups.

- The extent of community and stakeholder co-design to be involved and the methods of engagement to be used.

- Development of a program theory and logical framework based upon a series of "if-then" questions to develop the desired long-term impacts and indicators of success, medium-term outcomes, and practical outputs to be achieved along with the inputs of activities and resources required.
- A monitoring and evaluation plan and process.
- Negotiation of resources required for the plan and commitments from funding bodies.
- A communication strategy for housing recovery.
- Sourcing and/or stockpiling of short-term pods for short-term use.
- Strategies for reducing time in interim to medium-term accommodation.
- Strategies for using permanent prefabricated housing modules as the basis of progressive housing development.

Operational Decisions

- Detailed vulnerability mapping and compilation of local demographic, economic and environmental data to support the "fact basis" of decision-making.
- Assessment of local areas likely to be impacted by disaster events to determine the number of people and privately owned/rented dwellings in the zones most likely to be heavily impacted.
- Identification and implementation of disaster risk reduction strategies to protect dwellings and related infrastructure.
- Ways to engage with the multiple categories of vulnerable people in order to identify their preferred sheltering options and longer-term housing needs.
- Ways of operationalising the wraparound services to be provided and strategies for case management.
- Ways of guiding household decision-making across various housing options and of facilitating the rapid return to stable housing.
- Ways of building capacity for volunteer engagement in housing recovery.
- Strategies for evacuation and location and management of emergency relief centres
- Ways of undertaking the continuous audit of available rental properties.

Sample Decision Category 2: Monitoring and Evaluation[108]

Monitoring and evaluation (M&E) are related processes for collecting and analysing information on a process or project in order to make decisions about its quality, efficiency, and/or effectiveness and to learn lessons that can improve similar activities in the future.[109] This makes the regular checking of processes and achievements during a project (monitoring) and assessments of relative success or otherwise (evaluation) vitally important as central aspects of post-disaster housing recovery programs. Unfortunately, a review by the Australian and New Zealand School of Government (ANZOG) found that many evaluations of disaster recovery projects have been "inconsistent" and "haphazard".[110] The review particularly criticised the way that evaluations "tended to focus on the process of disaster recovery, rather than outcomes".[111]

This reflects the view in the 2011 National Strategy for Disaster Resilience that the lessons learnt from past evaluations of recovery programs "have tended to focus on how the response to an event may have been better managed" whereas "a resilient community must also evaluate recovery

efforts", i.e., the outcomes and impacts.[112] As a result, the ANZOG study called for the development of a Monitoring and Evaluation Framework for disaster recovery, which would:

> . . . ensure that disaster recovery programs can be evaluated for their effectiveness, and that these evaluations are undertaken in a consistent way. By improving the quality of disaster recovery evaluations, governments will be able to improve subsequent disaster recovery programs, to the extent that the learnings from these evaluations are incorporated into program design and delivery.[113]

Applied to housing recovery, such a framework would provide the following benefits and guidance:

- A common understanding of the meaning of 'housing recovery' and associated terminology.

- A list of high-level evaluation questions that can be addressed in any evaluation of housing recovery.

- Criteria for understanding what successful housing recovery 'looks like', including high-level indicators related to the domains of resilient recovery.

- A high-level program logic for the implementation of successful housing recovery programs.

- A guide for sourcing, collecting, and using quantitative and qualitative data to assess housing recovery.

- An evidence base for analysing lessons learnt from housing recovery programs.

- The use of regular monitoring for continuous improvement of recovery activities as well as a data source, along with end-of-program assessments, for evaluation and the identification of questions, issues and problems to be analysed to identify lessons for future recovery programs.

- Strategies for disseminating the lessons learnt from the evaluation of housing recovery. programs and ensuring particular capacity development needs are met.[114]

The development of common and agreed outcomes for housing recovery programs is of particular importance to enable shared understandings related to successful disaster housing processes, factors that enable and constrain successful recovery, and common problems that require attention. The AIDR Disaster Recovery Handbook suggests that resilient recovery needs to be planned and evaluated in terms of multiple domains (social, economic, environmental, and built environment. These match the characteristics of resilient recovery outlined in Chapter 4.2 (community connection, wellbeing, liveability, sustainability, and viability). The ANZOG review consulted with a wide group of stakeholders across to develop an agreed list of recovery outcomes based upon the AIDR domains.[115]

Another significant resource on **improving the quality of disaster recovery programs** is the AIDR handbook on *Lessons Management*[116], which provides particularly helpful guidance on moving from evaluation reports (and other insights) to workable lessons through the six-step OILL process of (i) identifying and collecting information; (ii) categorising and coding information; (iii) sorting and prioritising information categories; (iv) analysing categories for particular insights; (v) identifying lessons (or what needs to be learnt and the actions required to implement the lessons; and (vi) documenting the process. The handbook then provides further guidance for developing action plans for applying the lessons and then returning to the first step in a cyclical manner.[117]

Thus, key decisions at strategic, managerial, and operational scales for the decision category of Monitoring and Evaluation, could include:

Strategic Decisions[118]

- Development of an agreed Australian Disaster Housing Recovery Framework with the same status as, and consistent with, the National Strategy for Disaster Resilience and The Australian Disaster Recovery (Framework Version 3),

- Development of an agreed National Monitoring and Evaluation Framework with the same status as, and consistent with, the National Strategy for Disaster Resilience and the Australian Disaster Recovery Framework (Version 3)

- Development of an agreed National Monitoring and Evaluation Framework for Disaster Housing Recovery consistent with the proposed Australian Disaster Housing Recovery Framework

- Establishment of a high-level program logic for how successful housing recovery can be achieved with roles for the Commonwealth, State/Territory, and local governments

- Revision of the ANZOG publication, *A Monitoring and Evaluation Framework for Disaster Recovery Programs*, into a volume in the AIDR Disaster Resilience Handbook Collection.

- Establishment of national and or State/Territory repositories of evaluation reports and processes for regular cross-case analysis.

Managerial Decisions

- Integration of monitoring and evaluation of housing recovery with overall M&E processes for disaster recovery

- Development of processes for localising the National Monitoring and Evaluation Framework for use by State/Territory and local government agencies

- Identification of uniform monitoring processes and guides to selecting additional ones appropriate to housing programs in particular situations

- Selection of dimensions of resilient housing recovery for evaluation (e.g., built environment, social, economic, time, etc.), relevant high-level outcomes to be sought, and indicators for assessment.

- Development of common templates for monitoring activities and reports and evaluation reports.

- Training of operational staff to localise national and State/Territory M&E processes to particular housing recovery programs.

- Commissioning of evaluation reports and management of evaluation processes and action upon them.

- Development of guidelines for community understanding of, and participation in, M&E activities

- Management of processes for regular cross-case analysis of monitoring and evaluation reports as part of continuous quality improvement of housing recovery.

Operational Decisions

- Adoption of an evidence-based approach to all M&E activities

- Revision of local housing recovery plans in the light of lessons learnt from previous evaluation reports

- Development of a log frame and chain of inputs, resources, outputs, and outcomes for particular housing recovery programs.

- Construction of a workplan and timeline for achieving the planned outputs and outcomes as well as factors that can impinge on the overall impact of the program.

- Integration of M&E processes in the activities of Community Recovery Groups

- Regular and consistent collection of data for monitoring reports, identification of trends and issues in the data, development, and implementation of appropriate responses, and communicating such reports and actions to other staff and managers

- Communication and discussion of the results of M&E reports to disaster-impacted communities

5.4   Recommendations

9. Adopt the outline of a Decision-Making Framework for Disaster Housing Recovery provided in this report to provide a basis for the development of tools that can be used by multiple stakeholders in housing recovery programs and projects across different parts of Australia.

10. Establish a national repositories of evaluation reports and support processes for regular cross-case analysis.

6

RECOMMENDATIONS

6.1   Introduction

The purpose of this chapter is to synthesise the recommendations of this report. These potential follow-up activities were identified at the end of Chapters 3, 4 and 5.

In moving forward to any next stages of work undertaken by the SSRG as a follow up to the 'Temporary Housing Literature Review' report, we highly recommend, beyond each chapter's list of recommendations, that any further research could be delivered in the ways outlined in section 6.2 and section 6.3.

These practical dissemination and translation methods are suggested, while outside the scope of this initial project, so that that our report's key findings be actioned by the respective State and Territory agencies, before any likely and inevitable future scenario of floods and fires across the country.

6.2   Summary of Recommendations

1.   Terminology

Develop a standard set of terminology to describe the phases and types of accommodation displaced people may access on the path to stable housing and to be adopted by State and Territory recovery agencies. The terms recommended for consideration are: Emergency and Short-Term Accommodation, Temporary Housing and Stable Housing.

2.   Principles

Adopt common principles of leading practice in post-disaster housing recovery including community connection, wellbeing, liveability, viability and sustainability, for deciding accommodation and support options for people.

3.   National Principles

The Commonwealth and State/Territory governments should extend the agreed principles of disaster recovery to include principles of resilient recovery.

4.   Guidelines

Develop resources and guidelines to support planning and operational response for post disaster temporary housing.

5.   Capacity Building

Develop capacity building resources and programs for State/Territory agencies and local governments to support pre planning for disaster temporary housing.

6. Funding

Recognise different cost implications of temporary housing programs including indirect costs. Develop funding streams to address the priority needs.

7. Further Research

Undertake research into post disaster temporary housing topics such as:

- Improving housing resilience through land-use planning and building codes.
- Learnings from previous disasters on suitable approaches for different communities and contexts.
- Utilisation of innovative construction technologies, materials and methods.
- Utilising permanent prefabricated housing modules that transition from temporary to permanent.

8. Pilot Project

Resource, trial and evaluate a pilot program to identify ways of achieving a two-phase approach to assisting home-owners and renter households into stable housing.

9. Decision Making Framework

Adopt the outline of a Decision-Making Framework for Disaster Housing Recovery provided in this report to provide a basis for the development of tools that can be used by multiple stakeholders in housing recovery programs and projects across different parts of Australia.

10. Capturing Learnings

Establish a national repositories of evaluation reports and support processes for regular cross-case analysis.

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