SYNTHESIS SUMMARY 5

Community resilience and vulnerability

THE POTENTIAL FOR ADAPTATION

For some individuals and sectors of the community, greater exposure, lower resilience and reduced adaptive capacity can make them more vulnerable to climate change impacts. Investment in building community resilience and safety nets for the most vulnerable will help communities adapt to climate change.

NCCARF
National
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About this summary

About this series

Between 2008 and 2013, the Australian Government funded a large nationwide Adaptation Research Grant Program (the ARG Program) in climate change adaptation. The Program was managed by the National Climate Change Adaptation Research Facility (NCCARF). It resulted in over 100 research reports that delivered new knowledge on every aspect of adaptation. The aim of the Program was to help build a nation more resilient to the effects of climate change and better placed to take advantage of the opportunities.

This series of Synthesis Summaries is based on research findings from the ARG Program, augmented by relevant new literature and evidence from practitioners. The series seeks to deliver some of the policy-relevant research evidence to support decision-making for climate change adaptation in Australia in a short summary. It takes an approach identified through consultation with relevant stakeholders about the needs of the intended audience of policymakers, decision-makers and managers in the public and private sectors.

This summary deals with community vulnerability and resilience. The opening pages provide the context including the nature and impacts of climate change on communities and community vulnerability ('Why we need to adapt'), followed by a synthesis of available evidence around adaptation options ('The research base …'). It concludes with a summary of how this new research knowledge might help address key adaptation policy challenges. This final section is informed by a workshop held with practitioners ('Evidence-based policy implications').

This brief was developed by staff of NCCARF's Vulnerable Communities Network at the University of Adelaide with input on the policy challenges developed in workshops held in Mackay (Queensland), Adelaide (South Australia) and Cardinia Shire (Victoria) in December 2015. The workshops were attended by practitioners, policymakers and managers from within local, state and federal government organisations, community service organisations, not-for-profit organisations and universities.

The key research reports used to develop this summary are highlighted in Section 4. To see all reports from the ARG program, please visit **www.nccarf.edu.au/adaptation-library**.

Key findings

To ensure Australia's communities are well adapted to climate change, it is clear that investing in building community resilience and safety nets for the most vulnerable is important. Five principal adaptation challenges emerge from the research evidence:

1. **Share responsibility, devolve responsibility:** To ensure the concept of shared responsibility is equitable and effective, both institutions and community need a good understanding of their shared responsibilities for future risks.

2. **Find effective ways to inform and engage community to build resilience:** Effective communication and engagement are best carried out through strategies that are appropriate to community needs, create partnerships and trust and provide continuity of information and communication.

3. **Keep the most vulnerable safe:** Strategies are best targeted at identifying who is vulnerable, understanding the underlying causes of vulnerability and providing greater support and safety to those at greatest risk.

4. **Invest in existing networks and infrastructure to build community resilience:** Information channelled through trusted sources (e.g. community groups, charities, doctors) is more likely to be acted upon. Policies that can build partnerships with these channels are more likely to be successful.

5. **Understand recovery time:** Community recovery from major disasters can take many years. Policies and support that acknowledge and address these timeframes are more likely to build communities that cope better in the future.

1. Why we need to adapt: climate exposure and vulnerability

Australia experiences heatwaves, droughts, floods and tropical storms, all of which can impact on the health and general wellbeing of members of our society. For some individuals and sectors of the community, greater exposure, lower resilience and reduced adaptive capacity can make them more vulnerable to these impacts. People experiencing poverty, inequality, disadvantage and frailty – along with the community support organisations (CSOs) that support them – often bear the brunt of these impacts.[9,12]

Increased exposure to extreme events can affect, for example, those who cannot afford to cool their house, do not have adequate shelter or do not have the ability or resources to move to cool or safe refuges (e.g. shopping centres, libraries, emergency shelters) and so cannot shelter from the full force of extreme events.[12]

Some communities are exposed because of their location: such as being exposed to damaging winds on hilltops or to flooding in coastal areas and river valley bottoms. In coastal communities affected by sea-level rise, this might include exposure and disturbance of cultural heritage sites of Indigenous people.

Reduced resilience can occur because of factors such as existing compromised health (e.g. chronic illness, conditions of age), lack of financial resources to respond to impacts (e.g. under- or no insurance) and existing reliance on CSOs for financial support.[9] Many individuals and communities with reduced resilience are already exposed to climate risks, and any increase in the occurrence of extreme events will only exacerbate the impacts.

The number of extreme heat days (see Table 1) and extended heatwaves is expected to increase under climate change.[4] While projections of annual average rainfall into the future show a great deal of variability between models, there is some consensus that extreme rainfall events or higher rainfall intensities will become more common, exposing areas to greater risks of flooding.[4] Sea-level rise, when combined with the risk of storm surge, is also likely to lead to more frequent flooding in low-lying coastal areas.[4]

Bushfire frequency and intensity in parts of Australia are likely to increase (Figure 1), with warmer temperatures, combined with drier conditions, projected to create more severe fire weather conditions for the southern and eastern parts of Australia.[4]

Table 1 Average current and future annual number of days above 35 °C for selected cities, with a confidence interval given in brackets (10th and 90th percentile).[4]

Threshold	Current	2030 RCP4.5	2090 RCP4.5	2090 RCP8.5
Adelaide	20	26 (24–29)	32 (29–38)	47 (38–57)
Brisbane	12	18 (15–22	27 (21–42)	55 (37–80)
Canberra	7.1	12 (9.4–14)	17 (13–23)	29 (22–39)
Melbourne	11	13 (12–15)	16 (15–20)	24 (19–32)
Perth	28	36 (33–39)	43 (37–52)	63 (50–72)
Sydney	3.1	4.3 (4.0–5.0)	6.0 (4.9–8.2)	11 (8.2–15)

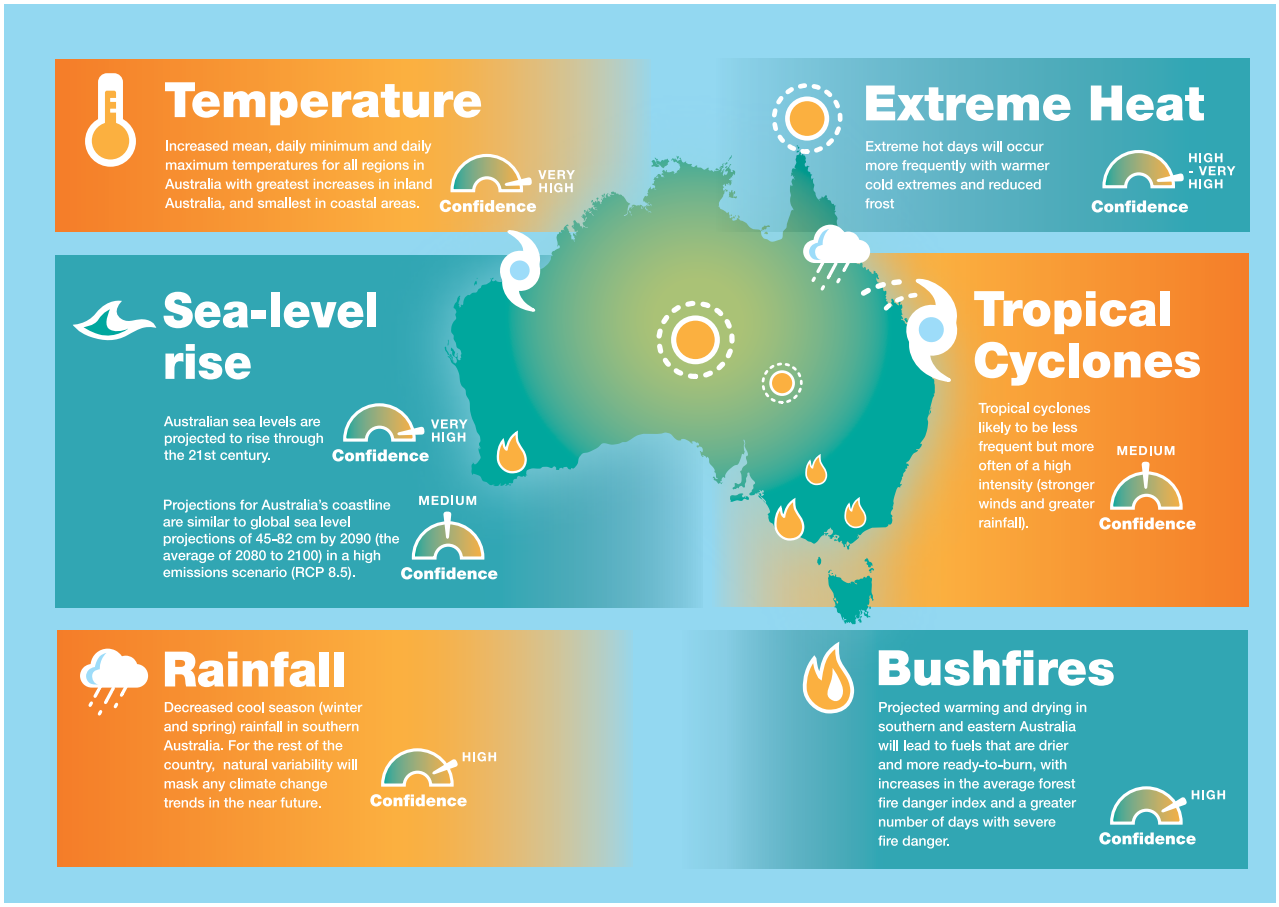


Figure 1 Summary of predicted changes in extreme climate conditions under future climate change.[4]

2. The research base informing community vulnerability and the potential for adaptation

2.1 Identifying vulnerable groups

We have already commented on the dynamic nature of vulnerability. It is common for sweeping assumptions to be made about who is vulnerable and who is not, identifying whole sectors of the community as 'vulnerable' based only on demographics. This is absolutely not the case. And while there are some factors that may increase vulnerability (e.g. poverty, social disconnectedness, mental and physical health and geographical location relative to social and transport networks[9,12]), the reasons people are vulnerable need to be carefully teased out if they are to be managed successfully.

Indigenous Australians are not intrinsically vulnerable, although many suffer multiple ongoing historical disadvantages, geographical factors and economic and social inequalities that increase their vulnerability to the effects of climate change.[11] In locations such as the town camps of Alice Springs, adaptive capacity can be jeopardised by poverty, overcrowded living circumstances and lack of electricity.[6] However, Indigenous people can be relatively resilient to changing circumstances and have a strong ability to adapt.[6,11] A study of the Arabana people (from the Lake Eyre region, South Australia) showed they have a high adaptive capacity, with strong cultural ties to their land and a deep understanding of the vulnerability of their country and cultural sites to climate change.[11] Many cultural heritage sites for both Aboriginal and Torres Strait Islander communities are located in low-lying coastal areas, making them vulnerable to more frequent coastal inundation associated with climate change.[8]

With worsening heatwaves, heat-related morbidity and mortality will drive a reduction in workforce productivity for outdoor workers.[10] Others at higher risk from the impacts of extreme heat include the homeless, people in low income households[1], people with chronic illnesses[7] and older people, including older migrants and those who live alone or in aged-care facilities.[2,5,7] Communities, households and individuals with multiple and interdependent disadvantages face greater challenges.[7] Having poor English language proficiency[7] and lack of acclimatisation to the heat can contribute to the risk of heat stress in newly arrived migrants and refugees. One of the factors associated with the vulnerability of new arrivals with low socio-economic status is poor quality housing[5] that lacks air-conditioning. In addition, vulnerable low income households are typically located in urban areas where land surface temperatures are highest and exposure to heat is greatest, adding to the risk of heat-related vulnerability during hot and humid conditions.[1]

Additionally, CSOs that provide support to people in need are not well prepared for climate change and extreme weather events. This organisational vulnerability can lead to major disruptions in support and social service provision to those experiencing poverty and inequality.[9]

2.2 Potential for adaptation

Adaptive capacity can be contingent upon resilience, social connectedness and levels of disadvantage. On an individual level, enhanced adaptive coping strategies have been found in people who are more likely to perceive climate change as a threat and who place importance on environmental goals and adaptive behaviours.[14]

Strong social networks are important for developing resilience and effective adaptation, whereas social exclusion and isolation are associated with lower adaptive capacity and greater vulnerability. Strengthening community connectedness and social inclusion will therefore bolster adaptive capacity.[5,13] Furthermore, the involvement of community and non-governmental organisations is essential in climate change adaptation.[13] Although vulnerable to climate change themselves, CSOs have the skills, knowledge and experience to contribute to community resilience and recovery from extreme weather disasters.[9]

Indigenous people through their connection to Country often have a clear view of the risks and potential impacts of climate change and the know-how to take action to address these risks. Government programs such as the Indigenous Rangers program and Working on Country recognise these realities and seek to tap into Indigenous knowledge and experience. Adaptation suggestions by the Arabana people include the establishment of cultural centres, land management programs and economic opportunities, as well as building partnerships and moving back to Country.[11] A collaborative approach to climate change adaptation discussions that recognises traditional knowledge, cultural identity and connection to Country and engages youth will help enhance adaptive capacity in Indigenous people.[8]

Adaptation includes building design, urban planning and infrastructure planning.[10] With the increasing older population being a heat-sensitive group, it is important that aged-care facilities have heatwave emergency plans and are well prepared in the event of power outages.[2] The social housing sector provides significant opportunities for adaptation to a warming climate and a reduction in heat-related health risks for vulnerable occupants.[1] Building upgrades that reduce indoor temperature extremes, urban greening to control land surface temperatures and the development of 'cool places' for respite should be factored into future planning for low income housing developments.[1] Disadvantaged groups struggle with the rising costs of utilities[13], and adaptation of houses and appliances will need to consider household energy use and costs.[6] However, these strategies for efficient energy and water usage must not compromise the health and wellbeing of householders.[6] In poorer, hotter neighbourhoods, urban greening can lower land surface temperatures, and changes to roof colour and ceiling insulation can reduce indoor temperatures.

In general, adaptive capacity will be enhanced by initiatives to overcome disadvantage and increase social and community connectedness.[13] Furthermore, information dissemination on current and impending climate change risks and adaptation options is needed, employing a diversity of languages and communication styles tailored to disadvantaged groups and those with poor English proficiency.[5,13]

Adaptation to a warmer and more volatile climate will require greater social connectedness (i.e. social capital) measures to reduce disadvantage, energy-efficient social housing that promotes adaptive climate practices, and heatwave planning for aged-care facilities. Better communication of climate risks and adaptation options for those experiencing poverty and inequality may help to build adaptive capacity in people more vulnerable to climate risks.

3. Evidence-based policy implications

ADAPTATION CHALLENGE 1:

Share responsibility, devolve responsibility

To ensure the concept of shared responsibility is equitable and effective, both institutions and community need a good understanding of their shared responsibilities for future risks.

Adaptation strategies look to build community resilience. The current approach to disaster management also takes a resilience approach, with an emphasis on shared responsibility.[3] There is a risk with this approach, if practice does not follow policy, that it can place an unfair burden on certain members of the community.

The shared responsibility approach requires both the public (government) and private (community) sectors to have a good understanding of their responsibilities and risks. This might include an understanding that there is a partnership, with government and community both meeting their individual responsibilities in order to achieve shared goals. This understanding could be further reinforced, for example, through a high level non-binding agreement on responsibilities.

The community is likely to need to be properly supported in taking responsibility for its risk. This support could be effectively provided through grassroots and one-on-one engagement. As trusted information sources with strong community connections, local governments are well positioned to provide not only an emergency response, but also a long-term recovery response. However, for this to be successful, resourcing and support would need to match this expectation, and local councils would need to understand their role. Recovery is a long-term investment beyond the 'sirens and lights'.

The volunteer response (e.g. State Emergency Services and Country Fire Service) is part of the sharing of responsibility, with communities investing in reducing their risk and building social connectedness and community-wide resilience through volunteering, while government at all levels is investing in prevention, risk reduction, coordination and capacity building. Policies that support this framing are likely to help build resilience and the ability of communities to adapt to new pressures.

ADAPTATION CHALLENGE 2:

Find effective ways to inform and engage community to build resilience

Effective communication and engagement are best carried out through strategies that are appropriate to community needs, create partnerships and trust and provide continuity of information and communication.

A resilient community is self-reliant, is willing to listen to authorities and to emergency organisations and has a trusting relationship with them. Building resilience relies on engagement, sharing information and social connectedness.

Information is best shared in a consistent way and as part of building partnerships, as opposed to simple dissemination. It is important to acknowledge that information does not equal engagement. Community engagement can empower the community to take responsibility for its risk, self-identify its vulnerability and empower members to share adaptation messages among themselves. This will in turn facilitate identification and use of trusted information sources within communities. Community engagement is likely to be most successful if it focuses first and foremost on community values and effects on those values, rather than on risk.

Effective communication strategies meet the needs of recipients. Risk communication calls for information to be targeted in the right way (e.g. via trusted networks, general practitioners and through community groups) and at the right place (e.g. library, community hubs). Communication of climate risks and ways to prepare for those risks that are more agile in speaking to different social groups and a diversity of communication channels are likely to be more successful. Culturally and linguistically diverse (CALD) communities would ideally be communicated with in their first language, and the information content should fully recognise their cultural values.

Messaging may need to be able reach tourists and new residents in an area, who may be separated from their normal communication channels and have no experience and possibly no knowledge of the risks they face. Past experience improves resilience and response. For those without past experience, case studies and personal accounts can be a useful surrogate.

One of the challenges of messaging is that different threats can require very different responses. Effective messaging will be clear, timely and straightforward to avoid confusing its recipients. For example, believing that information on preparing for a cyclone can be used to prepare for bushfire may prove disastrous: it would be a mistaken belief that sheltering in the house (as is advised during cyclones) is a safe option during bushfire. Information might include impact information (not just hazard forecasting) to help individuals understand their risks.

In the face of a natural disaster, there is social pressure for immediate funding and support. This can mean that recovery efforts may not match policy that builds resilience. For example, if a bridge is destroyed by flood there is immediate pressure to repair it, and this necessity for speed means that in all likelihood the bridge will be built back as was, rather than attempting to construct a more robust bridge to withstand more severe events. Forward planning to ensure plans are in place and approved for the more robust structure might help overcome this barrier to resilience building. Appropriate resourcing to support residents to address their own risks (through education and information) and implementing post-disaster recovery strategies that encourage rebuilding to higher standards will contribute to overall goals of building more resilient communities.

Efforts to understand why residents do not act on warnings and information might help develop policies and tailored communication products to improve response. For example, if failure to act is based on the expectation that someone else is responsible, then this could be tackled through community engagement and targeted education programs. An understanding of human behaviour, cultural experience and motivation will help support effective information delivery to ensure appropriate action is undertaken.

New technologies offer more flexibility and coverage for information and messages. It is important that these technologies be invested in and developed to support communication efforts.

Community connectedness has been shown to be key to creating resilient communities. Social connectedness is a difficult thing to create, but can be encouraged and fostered through development planning and programs of social inclusion, connectedness and community engagement.

ADAPTATION CHALLENGE 3:

Keep the most vulnerable safe

Strategies are best targeted at identifying who is vulnerable, understanding the underlying causes of vulnerability and providing greater support and safety to those at greatest risk.

While there are some clearly identifiable demographic connections to vulnerability, it is important to recognise that this does not provide a complete picture.

People are differently vulnerable to different risks, and it is not always the same people who are vulnerable to different climate extremes. Identifying vulnerable people and designing education and intervention programs to reach them should take into account this dynamic nature of vulnerability. Existing approaches to support vulnerable people (e.g. the heatwave strategy in South Australia[12]) should be tested for their effectiveness within this dynamic multifaceted context.

While direct intervention is an essential tool in supporting the most vulnerable members of our community, it must be balanced by efforts to develop resilience and adaptive capacity where possible to avoid creating dependencies. Dependency can expose recipients to new risks, for example, residents on a call list for extreme heat may wait in vain for a similar call to alert them to a bushfire risk. The direct intervention approach may also not be sustainable in the long term. To be successful, adaptation actions should include:

- building on strengths rather than simply identifying vulnerability
- managing expectations around support services
- an intervention response where necessary.

Approaches to adaptation can be informed by an understanding of the changing demographics of a community, including aging and major shifts in employment, and other non-climate factors that can increase vulnerability (e.g. development in high risk areas).

ADAPTATION CHALLENGE 4:

Invest in existing networks and infrastructure to build community resilience

Information channelled through trusted sources (e.g. community groups, charities, doctors) is more likely to be acted upon. Policies that can build partnerships with these channels are more likely to be successful.

In order to help vulnerable members of the community adapt, it is essential to work with those best placed to help them adapt. Policies might therefore look to build partnerships with and among those with existing channels into communities. This might include local government, local doctors (messaging), shopping centres (for refuge) and community organisations (checking on or transporting vulnerable people to shelter). In particular, there is clear evidence that CSOs are the best channel to assist the vulnerable and are strong advocates for their needs and rights.

Many of these organisations survive on short-term funding cycles. Financial assistance and support to these on-ground agents, if structured to ramp up at time of need, could then be available to enable both early action when an extreme occurs and sustainable, long-term programs. Evidence for reduced recovery costs as a result of CSO support might be used to build the case for investment.

Holistic programs that target specific vulnerable groups might usefully be developed, for example, minimising heat risks to the elderly through a range of approaches, including reducing social isolation, building awareness programs and designing and implementing clinical protocols. Programs could consider including investment in infrastructure that promotes resilience building, for example, public housing that incorporates passive solar design.

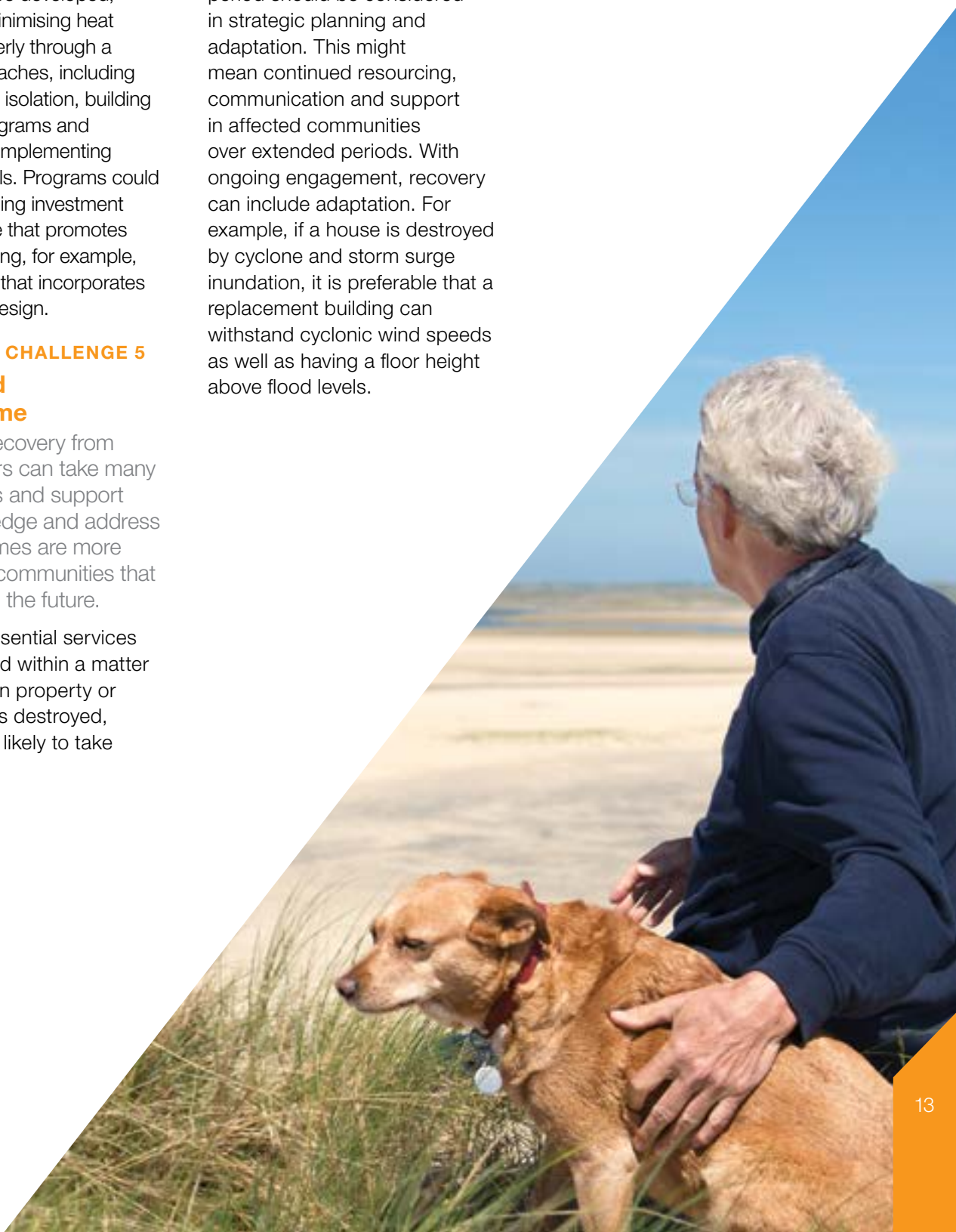
ADAPTATION CHALLENGE 5

Understand recovery time

Community recovery from major disasters can take many years. Policies and support that acknowledge and address these timeframes are more likely to build communities that cope better in the future.

While many essential services can be restored within a matter of weeks, when property or infrastructure is destroyed, full recovery is likely to take several years.

In order to build community resilience, this long recovery period should be considered in strategic planning and adaptation. This might mean continued resourcing, communication and support in affected communities over extended periods. With ongoing engagement, recovery can include adaptation. For example, if a house is destroyed by cyclone and storm surge inundation, it is preferable that a replacement building can withstand cyclonic wind speeds as well as having a floor height above flood levels.



4. Key information and references

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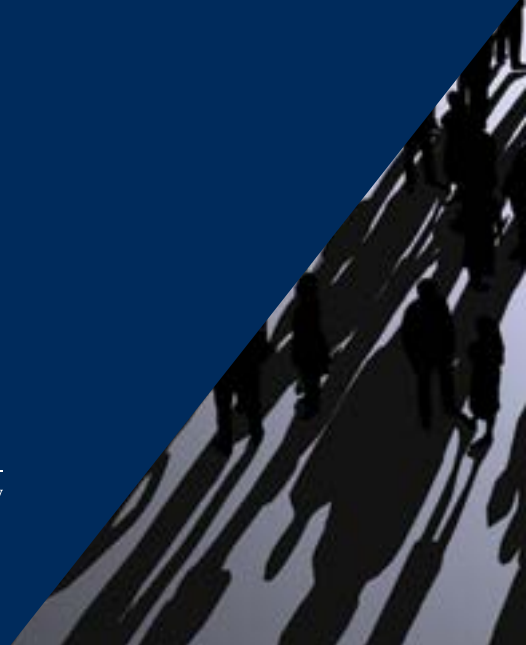
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