



INTRODUCTION

This discussion paper sets out what planners can do to strengthen resilience in response to a changing climate.¹ It extends PIA's overarching Position *Planning in a Changing Climate* with respect to adaptation and partners the PIA Discussion Paper on the *Role of Planning in Reducing Carbon*.

Adaptation measures are based on reducing vulnerability to the effects of climate change, while **mitigation** measures are those actions that are taken to reduce and curb greenhouse gas emissions. Mitigation, therefore, attends to the causes of climate change, while adaptation addresses its impacts.²

This paper recognises that climate change is occurring and its pervasive and episodic effects will continue.⁴ The role of planning is critical because shocks and natural hazards only become disasters where they interface with exposed and vulnerable people and settlement - and when their consequences exceed systems capacity to cope.⁵

Land use strategy, assessment decisions and supporting investment should enable communities and the natural environment to thrive in a changing climate.⁶

PIA supports a cultural shift to embed planning for resilience in every layer of strategic planning, policy and guidance - so that it becomes 'business as usual' - in addressing both ongoing change as well as acute and overlapping hazards.

Resilience...

is 'the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a shock or stresses in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management'.³

Implications of a changing climate:

- Urban heat
- Coastal erosion and inundation
- Severe weather
- Bushfire
- Drought
- Ocean chemistry and temperature
- Flooding
- Exposure to disease
- Habitat loss and deterioration

OBJECTIVES

Planning should promote measures that reduce hazard exposure and vulnerability as well as increase preparedness for response and recovery.⁷ Planning decisions should strengthen resilience, and limit the impact of disasters and climate related changes on communities, the economy and environment by:

- Ensuring planning strategy and systems are responsive to subtle and pervasive shifts in economic, social and environmental conditions.
- Identifying and managing risks and hazards affected by climate change, including vulnerability to multiple and overlapping hazards over time.
- Locating, building and managing future development (and infrastructure) within acceptable levels of vulnerability over a long-term planning horizon.
- Avoiding unacceptable risk - where there is an unmitigated risk (especially to human life) the prevention of vulnerable development is appropriate.
- Enabling 'building back more resilient' - ensuring buildings, property and infrastructure are resilient to acceptable levels of future exposure.
- Ensuring that responses to climate change and hazards do not erode natural values and biodiversity and conservation is strengthened.
- Removing barriers to rapid response that do not prejudice long term recovery and resilience.
- Enabling local community response, recovery and resilience via adaptive management pathways that sustain community vigilance.
- Embracing Indigenous knowledge to respect that resilience reflects a deeper relationship between communities and the land.
- Improving consistency and coherence of land use and infrastructure strategy across jurisdictions.



PLANNING STRATEGIES

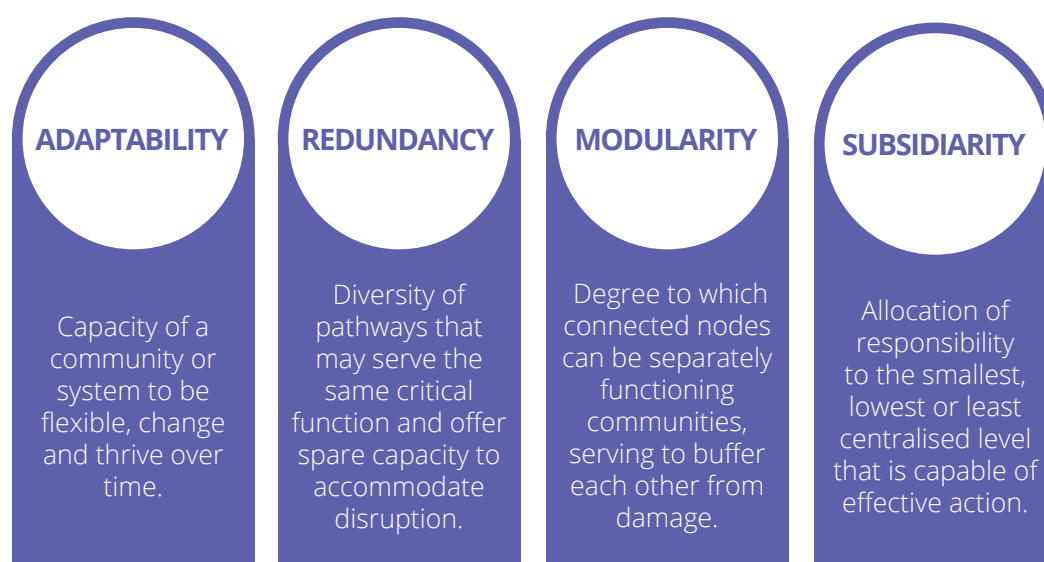
The following planning strategies respect the *Australian Institute of Disaster Resilience Principles for Disaster Resilient Communities* (**Attachment A**) and are informed by *PIA Guidelines for Land Use Planning for Disaster Resilient Communities*.

Planners should note that land use planning strategies in isolation may not be an effective way of balancing natural and cultural values in response to climate change threats. Planning strategies should work alongside other incentives.

Planning strategies should:

- Test **changing hazard and risk profiles** in scenarios to inform strategic plans and address uncertainty – noting that historical projections are not always relevant in a changing climate.
- Test the **relevance of planning strategies** to more pervasive and gradual changes impacting the human and natural environment.
- Identify the **settlement planning parameters** for scenarios in a coherent and consistent way e.g. National Settlement Strategy and in State and Territory Regional Planning Frameworks and resilience strategies.
- Base planning parameters on **consistent assumptions for potential exposure** with regard to:
 - population and community vulnerability
 - acceptable risks for bushfire, sea level rise, flood and urban heat
 - design life⁸ of housing, buildings and key infrastructure
 - infrastructure demand assumptions per capita.
- Set planning outcomes and supporting guidance at a **landscape scale** – and address the vulnerability of individual properties, buildings standards, access arrangements and infrastructure within this landscape context.
- Set strategic planning responses within **adaptive management plans** or pathways that are responsive to new information and threat reappraisal. Responses should not just be cost effective in achieving a single strategic planning outcome – but consider whether they promote a diversity of pathways that might assist adaptation to evolving threats - or enable managed retreat/avoidance in the future (see *Figure 1: Characteristics of resilient systems*).
- Move **beyond the ‘approve and forget’ paradigm** and enable adaptive management. This includes promoting innovation in governance and collaboration among local communities, Indigenous peoples and across agencies to generate solutions that fall outside traditional silos – such as green infrastructure addressing flood and urban heat threats (including vegetation).
- Ensure consideration of climate risk occurs at **every level of Government** – and that adequate information and policy context (e.g. overlays) are available for the private sector and Government to manage risks accordingly and appreciate the dimensions of uncertainty.
- Give statutory effect to key **resilience strategies**, plans or guidelines.
- Integrate the **management of natural values and protection of biodiversity**.

Figure 1: Characteristics of resilient systems⁹



TOOLS & INDUSTRY CAPACITY

At a national scale, a framework is required that ensures consistent and coherent planning parameters are used for population and demographic change, infrastructure demand and vulnerability to climate threats. This could be incorporated in a National Settlement Strategy and be an element of a National Climate Adaption Plan for the built environment sector.

At a state or territory level, a resilience framework should:

- Inform **planning scenarios** for climate change related vulnerabilities (and their time frames) – and ensure that future risks are considered when making land use decisions.
- Ensure **early and active engagement** of emergency management and land use planning professionals in long term planning and infrastructure decision making.
- Identify the **limits of planning responses** – and highlight the role of other incentives, investment or regulation.

- Provide **proactive planning and assessment pathways** for desired development and planning approaches (e.g. site vegetation cover, urban heat mitigation, flood storage, regenerative agriculture, planned retreat).
- Define an **unacceptable and unmitigated (residual) risk** and the associated approach to resolve development decisions.

Infrastructure evaluation guidelines at National and State/Territory level should consider climate vulnerabilities, life cycle costs (with respect to climate change timeframes) and opportunities to fund and procure more resilient infrastructure (or alternatives) rather than just replace.

Regional Plans should incorporate a resilience strategy – based on PIA/AIDR Guidelines – applying a definition of acceptable risk, addressing multiple hazards and requiring the consideration adaptive management pathways.

Regional planning should be supported by strategic guidance on hazard management at landscape scale especially for bushfire and flood.¹⁰



Local government should be empowered as place managers to design governance arrangements and implement adaptive management plans so that mutual obligations to manage risks are maintained among the community, landowners, and agencies beyond initial planning decisions. This would require further initiatives to improve agency collaboration and enable the adaptive management planning approaches to address evolving climate hazards. Planners in private practice are well placed to lead innovation in partnership with their clients.

At a practitioner level, there is an opportunity to improve the availability of digital hazard mapping via e-planning portals. Planners should also shape the development of digital planning tools and models that assist scenario planning and interrogation of future conditions and their implications for development.

ENDNOTES

1 Bureau of Meteorology (BoM) and CSIRO 2020, *State of Australia's Climate: The implications of a changing climate include changes in weather and climate extremes (and their frequency)— extreme heat, heavy rainfall, more intense cyclones, coastal inundation, bushfire weather and drought—each have an impact on the health and wellbeing of communities and ecosystems. Sea level rise and other marine impacts associated with global warming progress alongside these changes.*

Planning Institute of Australia 2015, *The Role of Planning in a Changing Climate* <www.planning.org.au/policy/climate-change-0510>

2 Acciona, *Mitigation and Adaptation to Climate Change*, nd <<https://www.activesustainability.com/climate-change/mitigation-adaptation-climate-change>>

3 United Nations Office for Disaster Risk Reduction 2017, *Global platform for disaster risk reduction: Proceedings* <www.undrr.org/publication/2017-global-platform-disaster-risk-reduction-proceedings>

4 BoM and CSIRO State of Australia's Climate Report <www.bom.gov.au/state-of-the-climate>

5 Australian Government Department of Home Affairs 2018, *Profiling Australia's Vulnerability* <knowledge.aidr.org.au/resources/profiling-australias-vulnerability>

6 This would contribute to United Nations Sustainable Development Goal 11: Making cities inclusive, safe, resilient and sustainable <www.un.org/sustainabledevelopment/cities>

7 United Nations 2015 Sendai Framework <www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

8 Witte, E 2020 *Land use planning climate change and changing natural hazards*, Planning News Vol 46 (Feb)

9 Kharrazi, A et al 2020 'Redundancy, Diversity, and Modularity in Network Resilience: Applications for International Trade and Implications for Public Policy' *Current Research in Environmental Sustainability* Vol 2

10 See Recommendation 27 of Final Report of the NSW Bushfire Inquiry 2020 <<https://www.nsw.gov.au/nsw-government/projects-and-initiatives/nsw-bushfire-inquiry>>

APPENDIX A: LAND USE PLANNING PRINCIPLES FOR DISASTER RESILIENT COMMUNITIES (AIDR)

1. Prioritise life and relief of suffering

Land use planning is a multi-objective process. A genuine attempt to consider the current and future risk implications of planning decisions prioritises the protection and preservation of human life of existing and new communities over all other considerations. This also includes considering the protection of emergency responders.

2. Sustainability

Risk avoidance, limitation of growth in risk, and reduction is a fundamental subset of overall sustainability. This means that land use planning must seek to ensure that cities, towns and regions can sustain and improve their functions over time, including avoiding, limiting and withstanding the impacts of the full range of risk associated with natural hazards. This also recognises the need to respect and maintain the natural systems upon which human systems rely in land use planning processes, in tandem with the recognition that sustainable economic, social and environmental sustainability are linked with improved resilience.

3. Pursue resilient, sustainable and liveable communities

Planning decisions are to support improvements to resilient, sustainable and liveable communities, and to minimise the effects of socioeconomic inequalities on vulnerable members of the community.

4. Support the preservation, maintenance and enhancement of functional natural systems / ecosystems

Planning decisions are to support the preservation, maintenance and where possible enhancement of functional natural systems / ecosystems. Human systems rely on and are ultimately subservient to natural systems, even though we may damage and affect them. Decision criteria and mechanisms to support this are in place to ensure the intensification of development is compatible with the natural hazard potential and functionality of natural systems.

5. Recognise that some land may be unsuitable for certain activities or development

Planning decisions are to recognise that not all land is suitable for intensification of development and not all development types are viable at a particular location. Decision criteria and mechanisms to support decision-making based on hazard information are to be in place to ensure the intensification of development is compatible with the risk profiles of natural hazards to both existing and future development and its users.

6. Consider cumulative impacts of changes in development and demographics

Land use planning processes are to consider the cumulative effects of new development on both the demographics of the community and on the behaviour of natural hazards and their impacts on both the risks of natural hazards to the existing community and the emergency response of the existing community.

7. Consider how hazards vary with climate change for an appropriate planning horizon for development decisions

Planning decisions need to build in consideration of how natural hazards vary with climate change within the planning horizon related to the development decision. Forward planning for the consideration of climate change impacts on natural hazards is the best approach to mitigate these risks on communities. The distinction between a planning horizon and the horizon of the hazard assessment needs to be considered in the decision-making processes.

8. Promote multidisciplinary collaboration

Risk management in communities requires coordinated and integrated action across a range of sectors and capabilities. Land use planning needs to be supported by reliable expert information on natural hazards and where possible relies on processes that draw on a diversity of stakeholders, views and capabilities. Management of natural hazards and protecting ecological processes and sustainability can be mutually beneficial if Principle 9 is utilised.

9. Consider natural hazards early in and throughout land use planning processes

All land use planning processes, starting with strategic planning are to consider the management of natural hazard risks to the community. Land use planning is to consider the full range of risks from natural hazards early in the planning processes, particularly by directing new development to suitable locations to avoid or reduce the exposure of new development to natural hazards and the impact of new development on the ecosystems and their behaviour as natural hazards.

10. Support evidence-based land use planning processes, risk assessment and scenario testing

Land use planning processes are underpinned by a range of information to support decisions based on risk. Scenario testing and appropriate decision support tools are to be used where possible.

These processes are to include deliberate data capture for information considering: information specific to different natural hazards and how they may vary between events of different scales and across the geographic locations in a range of scenarios; data analysis linked to an understanding of dynamic change (e.g. social and demographic change, changing risk factors etc.), external factors, identification of a range of risk scenarios, and risk acceptance alternatives.

11. Use the full range of risk treatment mechanism options prioritising avoiding risks

Land use planning is to use the full range of mechanisms available to treat disaster risk, emphasising forward and strategic planning. These include: avoidance or reduction of exposure and reduction of vulnerability. These measures can reduce impacts upon development and the impacts of new development upon natural systems, and impacts to the community.

12. Monitoring and review of land use planning decisions

Strategic land use planning should include ongoing monitoring and review of the effectiveness of plans in managing the growth of the impacts of natural hazards on the community.