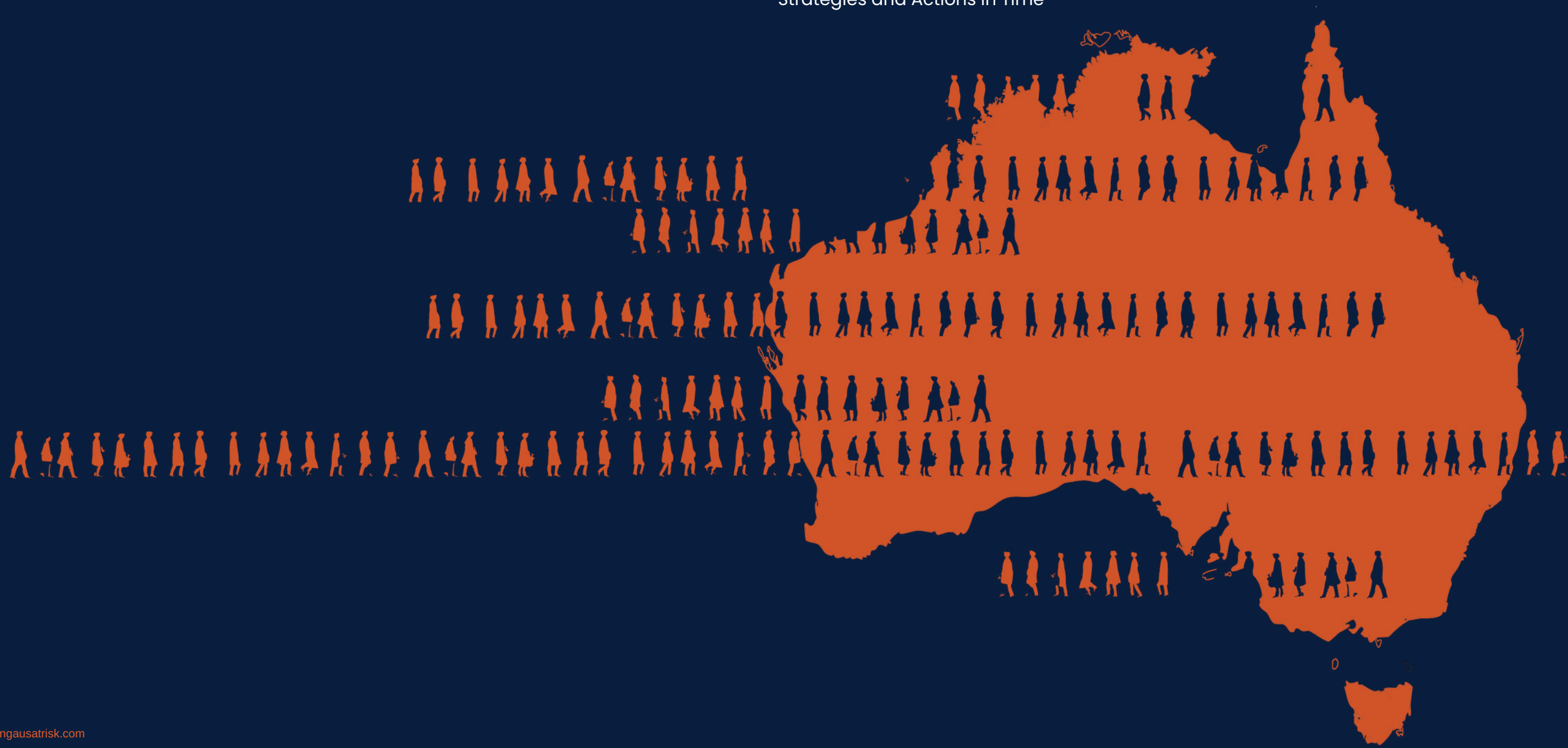
Relocating Australian Communities at Risk:

Strategies and Actions in Time



https://relocatingausatrisk.com

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We acknowledge, celebrate, and pay our respects to all First Nations Australians on whose traditional lands we meet and work, and whose cultures are among the oldest continuing cultures in human history.

“Only avoidance and relocation can remove coastal risks for the coming decades, while other measures only delay impacts for a time, have increasing residual risk or perpetuate risk and create ongoing legacy effects and virtually certain property and ecosystem losses (high confidence).”[1]

1 Intergovernmental Panel on Climate Change (IPCC).

PREFACE

This issues paper contributes to an emerging yet crucial national conversation on the necessity of developing and implementing a National Relocation Strategy for at-risk communities in Australia. The document and accompanying website aim to foster a comprehensive dialogue leading to the creation of new research, collaborations, initiatives, and policy developments in light of the escalating risk faced by Australian communities in a changing climate. Tailored for policymakers, industry leaders, educators, media professionals, community organisations, and community members alike, it aims to initiate a wide-ranging interdisciplinary conversation that extends beyond current practices.

Climate change is impacting the lives and livelihoods of people globally, with a significant percentage of Australia's population living in areas increasingly exposed to its effects and associated extreme weather events. As sudden-onset hazards including floods, cyclones, and fires, alongside slow-onset hazards such as sea-level rise, severe heat, and drought, displace people from their homes or compromise their safety, there is growing acknowledgement that planned relocation of communities out of harm's way will become an important factor in national decision-making. Communities impacted by consecutive climate-related disasters are grappling with questions of how and where to rebuild, with relocation emerging as an increasingly necessary option to ensure future safety.

Given these circumstances, Australia will need to shift focus to the locations of its communities, towns, and cities. Strategic planning across sectors and disciplines will be important to ensure communities, industry and governments are taking pre-emptive action to minimise risks, damage, and losses from climate-related disasters. Developing a National Relocation Strategy, built upon evidence-based risk assessment, is crucial for progressing relocation strategies that place the safety, dignity, and agency of people at the centre. While climate change affects communities with varying intensity, structural and systemic factors escalate vulnerability, creating disparities in access to the resources, support, and community capacity necessary to deal with the impacts.

It is crucial that discussions on planned relocation encompass the diversity of knowledge and expertise within Australia. Any future relocation processes will need to be well-planned, voluntary, graduated, and participatory, with community at the centre of decision-making. First Nations communities, as the traditional custodians of this land, have cultural and ancestral connections to place and have cared for Country for many thousands of years. Their knowledge will play a key part in developing strategies for potential relocation scenarios and resettlement in the context of climate change.

The establishment of a National Relocation Strategy would aim to protect and enhance lives. A national approach ensures policy coherence across governments horizontally and vertically, facilitating long-term, adaptable, and sustainable processes based on localised risk reduction knowledge. Developing a relocation strategy for Australian communities at risk involves identifying starting points for preventative action and navigating cultural, social, environmental, economic, political, and institutional complexities involved.

This document outlines the rationale for the need for such a strategy and offers points of consideration for its design and implementation for at-risk communities. Stemming from collaborations at an initial workshop held in February 2023 at the Australian National University, Canberra, this project brings together researchers from across Australian universities and industry practitioners, with expertise in the fields of design, architecture, philosophy, science, disaster science, social science, risk and vulnerability, urban systems, and logistics. Above all, this project recognises that the challenges Australia faces will require vision, imagination, and informed critical knowledge of climate futures. To address these challenges the project team invites collaboration across government, industry, academia, and communities, aiming to bring together a network of people to continue this shared journey.

KEY MESSAGES

1. Creation of a National Relocation Strategy for Australian Communities at Risk

Relocating Australian communities at risk is the only way to protect people and infrastructure vulnerable to some of the worst impacts of climate change. Planning for relocation should only occur after exploring all other options for risk mitigation. This planning will require establishing an enabling environment, including the development of a legal framework for implementing planned relocation, conducting consultations, building capacity, and adopting a whole-of-government approach. The establishment of a National Relocation Strategy would facilitate this process efficiently and effectively while prioritising the safety, dignity, and agency of individuals and communities. Developing the strategy would require the formation of inclusive working groups, encompassing diverse knowledge sources including affected communities, First Nations Peoples, a broad spectrum of industry professionals, governance at all levels, humanitarian organisations, and researchers. Further, an integral aspect of the strategy would include the establishment of guidelines for planned relocation, modelled after those that have been developed internationally, particularly in the Pacific Region.

2. Establishment of a National Relocation Authority

Climate change and the associated risk will impact the whole of Australia, necessitating a nationwide approach. Upon its establishment, a National Relocation Authority would spearhead the development and execution of the National Relocation Strategy, while collaborating with and supporting states, territories, local authorities, communities, and individuals throughout the relocation process. This Authority would collaborate closely with the Australian Climate Service (ACS), National Emergency Management Agency (NEMA), and state and local governments to identify communities most vulnerable to risk. It would establish a framework to streamline relocation planning, expertise sharing, resource allocation, and the implementation of standardised legal and economic processes. Moreover, the Authority would identify and establish appropriate governance structures and support services. A consultative committee representing key stakeholders, would collaborate with a government task force to define the structure, terms of reference, and operational model of this Authority.

3. Development of Dynamic Risk Mapping

Traditional static risk maps have limitations in modelling the complexity of compounding and dynamic risks. Mapped features undergo constant change, and risks are not discrete as traditionally depicted; rather, they overlap and interact with each other. Developing evidence-based dynamic risk mapping is integral to understanding intersecting and compounding risks and complexity. Environmental, climatic, spatial, and vulnerability mapping that forecasts emerging and future enviro-climatic risks serves to identify priority locations. Additionally, it aids in raising awareness, fostering community dialogue, facilitating transparent communication among government, industry, and community stakeholders, and guiding timely and strategic actions to ensure community safety. This mapping initiative would be further developed in collaboration with the ACS and other public and private agencies involved in mapping risk.

4. Development of Resource, Skills, and Logistics Registers

The Relocation Authority would establish registers containing information on public and private sector resources, infrastructure, available land, machinery and equipment, and supply chains relevant for planned relocation. This would ensure that the necessary information for developing a National Relocation Strategy is readily available. Concurrently with the risk mapping process, this involves identifying potential existing materials for reuse, repurposing, and recycling, as well as forecasting requirements for additional materials and resources pertaining to planned relocation. Including an inventory of existing skills and expertise within the community in these registers is provides an important service, allowing the development of feasible scenarios based on local knowledge.

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACS	Australian Climate Service
ADF	Australian Defence Force
AIDR	Australian Institute for Disaster Resilience
ANU	Australian National University
CECC	ANU College of Engineering, Computing and Cybernetics
COP	Conference of the Parties (to the UN Framework convention on Climate Change)
DCCEEW	Australian Government Department of Climate Change, Energy, the Environment, and Water
GDS	Grantham Development Scheme
GHG	Greenhouse Gas
ICA	The Insurance Council of Australia
ICEDS	ANU Institute for Climate, Energy and Disaster Solutions
IFRC	International Federation of Red Cross and Red Crescent Societies
IOM	International Organisation for Migration
IPCC	Intergovernmental Panel on Climate Change
NDCs	Nationally Determined Contributions
NEMA	National Emergency Management Agency
NSW	New South Wales
PDD	Platform on Disaster Displacement
PMF	Probable Maximum Flood
QLD	Queensland
SOAD	ANU School of Art and Design
SDG	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction 2015-2030
TFD	Task Force on Displacement
UC	University of Canberra
UN	United Nations
UNDRR	United Nations Office for Disaster Risk Reduction
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees
USYD	University of Sydney
UTAS	University of Tasmania
WHO	World Health Organisation

GLOSSARY OF TERMS

Adaptation – "Adaptation, in response to current climate change, is reducing climate risks and vulnerability mostly via adjustment of existing systems. Many adaptation options exist and are used to help manage projected climate change impacts, but their implementation depends upon the capacity and effectiveness of governance and decision-making processes"[2] as defined by the Intergovernmental Panel on Climate Change (IPCC). It may also involve social transformation.

Buybacks – the practice of any level of government in buying property in areas of high climate risk where there is the expectation that such risk will continue or worsen in the future, thereby enabling the initial property owner to purchase another property in a low-risk area.

Disaster (here climate induced) – refers to a "serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts"[3] as defined by the Australian Institute for Disaster Resilience (AIDR).

Disaster risk reduction – aims at "preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development. Disaster risk reduction is the policy objective of disaster risk management"[4] as defined by the AIDR.

Displacement – the consequence of climate and environmental risk or impacts that force people to relocate from where they live. It can also result from existential conditions of material and physical insecurity that affect people's state of mind.

Capacity – the ability to acquire the material, economic, psychological, and intellectual means to respond to challenging changing circumstances.

Capacity building – the creation of those conditions that enables individual and collective coping capacity to develop.

Capacity (of) community – the collective capacity of the social relations of a community to relationally gain the means to cope with the challenges it faces over time.

Climate change – in this document refers to combined natural and anthropogenically created structural changes to the climate system.

Climate migration – the process of movement (forced or voluntary) from a location at risk

from, or experiencing, negative climate impacts to another location where the risks are relatively low now and into the future.

Design back from the future – a method where informed predictive environmental, social, and economic changes direct the parameters of design decisions and action to enable the ability of whatever is designed to endure over time.

Futures – is used in this document to indicate that the future is plural but not empty and is defined by the ongoing consequence of past and present actions as they constrain conditions of possibility.

Hazards – describes "a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption, or environmental degradation. Hazards may be natural, anthropogenic or socionatural in origin"[5] as defined by the AIDR.

Logistics – the process by which resources are assembled and mobilised by available means.

Planned relocation – the action that is taken once risk has been identified and seen to be serious. It requires having time to find a relocation destination, acquiring it, establishing the condition of occupation with full community participation, and fully organising the process of moving.

Relocation – in this document refers to an organised process of community migration from one place at risk to another settlement with a viable low-risk long-term future.

Risk mapping – combines the identification of a specific risk and its transposition to a specific geographic location.

Scenarios – the representations of possible future events or circumstances in order to conceptualise appropriate designed and planned responses.

Socio-economic futures – acknowledge that social and economic change are indivisible linked: the one always influences the other.

Sustainable/sustainability – describes "meeting the needs of the present without compromising the ability of future generations to meet their own needs"[6] as outlined by the World Commission on Environment and Development. Current thinking is embodied in the 2015 Sustainable Development Goals which "are a call to action to end poverty and inequality, protect the planet and ensure that all people enjoy health, justice and prosperity."[7]

Viable destinations – destination sites that can be rendered sustainable.

Vector borne diseases – transmitted from one location to another by biological means able to travel, especially insects or animals.

Vector mapping – recognises that enviro-climatic and socio-ecological conditions continually change. Any conventional map that claims to represent change fails to do so as it just represents it in an arrested moment.

INTRODUCTION

Relocation will become more often essential for both successful climate change adaptation and disaster risk reduction. It is a measure of last resort when adaptation in situ is no longer viable. As the climate continues to warm and challenge our ways of life over the coming decades, many Australian communities will need to relocate partially or fully to protect people from impacts such as sea level rises, storm surges, flooding, coastal erosion, heatwaves, bushfires, droughts, or lack of fresh water.

The unfolding and diverse impacts of climate change will present fundamental threats to Australian settlements, towns, and cities. Communities situated along rivers, floodplains, low-lying coastlines, in severely drought-affected areas and in regions confronting extreme heat and bushfires are all facing escalating risks. These impacts are exacerbated by environmental degradation, including vegetation clearing, land destabilisation, removal of coastal dunes and wetlands and construction of hard surfaces in built environments.

An increasing number of Australian communities will require partial or total relocation to more viable sites in the coming decades. In recent years, both in Australia and globally, there has been a significant increase in people displaced from their homes and forced to decide whether to rebuild or relocate due to climate-related hazards, assuming they have the resources and capacities to do so. Between 2008 and 2022, an estimated 243,000 internal displacements occurred across Australia due to disasters.[8] Events such as the Grantham and Lockyer Valley floods in 2011, the Black Summer Bushfires of 2019-20 and the NSW Northern Rivers floods in February and March of 2022 are just a few recent examples of disasters leading to displacement in Australia.

The scale, form, typologies, costs, and timeframes of planned relocation will be complex, presenting significant challenges for Australian communities at risk and straining policymaking-processes, budgets, and capacities in unprecedented ways. While relocation will unfold over decades, if governments, industry, and communities begin planning now, the process of relocation will be more effective and efficient, resulting in far less trauma than a recovery-led relocation approach. The establishment of a National Relocation Strategy for communities at risk would acknowledge the enduring consequences of climate change, extending beyond current impacts, and pre-emptively manage the complexity of multi-scaled, staged relocation.

Fig. 1. Cyclone Yasi Boats

What is Planned Relocation?

Governments worldwide are actively planning and implementing policies and strategies for planned relocation. In Australia, planned relocation strategies are already under examination by insurance groups.[9] Planned relocation, a dynamic concept, holds the potential to safeguard lives, assets and infrastructure from current and future harm induced by climate change.[10] It can be temporary, permanent, or cyclical. Planned relocation is the process by which a community facing climate or environmental risk is supported and adequately funded by government to move to a new location, placing voluntariness, agency, dignity, and community safety at its core. Fundamentally, planned relocation serves as a pre-emptive approach to prevent disaster displacement and support communities grappling with the challenges associated with climate change.[11]

Multiple relocation scenarios would need to be considered based upon various climatic social, environmental, and economic conditions. These scenarios include partial relocation, relocation of one or multiple sites to a single destination location, relocation of a single site to multiple destinations and merging one or multiple sites with an existing settlement.

Planned relocation is intricate and sensitive. A relocation strategy begins by developing a process for the identification of at-risk communities, and understanding the nature and level of risks they face over extended time frames. Community participation in identifying potential new locations, scale, and conceptual form, is crucial in garnering support for relocation. Likewise, considerations of environmental and cultural concerns, land acquisitions, funding mechanisms and logistical challenges require careful consideration and strategic planning. First Nation communities, as the traditional custodians of the land, have cared for Country for thousands of years with cultural and ancestral connections to place. Their knowledge and guidance are important in decision-making processes for relocation, paying respect to traditional Indigenous knowledge and perspectives and the rights to practice culture and remain connected to ancestral homelands.

With varying capacities and unequal access to resources, not all communities affected by disasters are impacted equally. People who have experienced disaster displacement may face further barriers to recovery due to structural or systemic factors that worsen vulnerability, with disasters exacerbating social inequities and mental health issues.[12] Some people may choose not to relocate due to various factors including financial, emotional, psychological, social, cultural, and intergenerational considerations. Although loss, disruption, distress, and hardship cannot be entirely avoided, strategically planned, graduated and participatory relocation processes implemented prior to disasters can help to mitigate these challenges. Planned relocation for increasingly uninhabitable locations will help to protect people from further harm and provide necessary resources, support, and services to rebuild lives and livelihoods.

Fig. 2. The First Relocated House Being Carried up Into the New Estate

1. CLIMATE IMPACTS, RELOCATION, AND GLOBAL APPROACHES

Globally and across Australia, the impacts of climate change are already exacerbating food, water, and energy insecurity, eroding livelihoods, cultural ties to the land and traditional ways of life. This has led to disempowerment within communities and challenges to social networks and stability. As a result, a growing number of people have either been displaced from their homes or are at risk of displacement, prompting difficult decisions about relocating to safer environments. With the escalation of climate change effects, the frequency and intensity of disasters are also on the rise. Planned relocation of communities out of harm's way, before locations become uninhabitable, will be a crucial decision that governments will need to address to safeguard individuals and communities.

1.1 Planned relocation is not new

Relocation has been a central theme throughout human history. After earlier hominin migrations out of Africa 2 million years ago, Homo sapiens dispersed across the planet, apparently driven by the need for refuge from climatic conditions and towards securing water, food, and resources.[13] This global and regional nomadism, coupled with the availability of various food types and climates, profoundly influenced human development, health, and survival. Consequently, humans have adapted to and significantly altered their surrounding environment. Approximately 12,000 years ago, the advent of agriculture, followed much later by urbanisation and industrialisation which further transformed the environment, led to systems that now drive climate-related disasters and environmental degradation, and increasingly the likelihood that historically settled areas may become uninhabitable.

Within this global context, Australia has a complex history of relocation. Despite First Nations people nurturing and caring for the land for at least 60,000 years, the past 235 years have seen radical ecosystem transformation, environmental degradation, and biodiversity loss as a result of colonisation, industrialisation, population growth and poorly planned settlements. There is history of government sponsored and supported settlements, and Colonial and European settler Australia saw planned or publicly supported relocations for economic and social purposes, including closer settlement schemes in the 19th century and soldier settlement and irrigation development schemes and decentralisation policies in the 20th century.

Planned relocation due to climate change, disasters, or environmental degradation is not a new phenomenon. Governments

worldwide have relocated communities to protect them from climate-related disasters and environmental changes. Such planned relocations have been documented across all inhabited continents in at least 78 countries.[14] However, many of these attempts have been characterised as ad hoc, focusing primarily on mitigating risk in isolation of other societal variables.[15] This highlights the chronic lack of preparedness and institutional guidance associated with climate-induced relocation. Internationally, the prevailing narrative emphasises that successful relocation entails effective governance, community participation and the preservation or enhancement of livelihoods, rather than an approach that solely focuses on risk reduction.[16] [17] [18]

1.2 What the science tells us

Whilst some disasters are immediate, situated, and easily recognisable, the same cannot be said for the 'slow' disasters of climate change. Past climate changes were due to natural variations and events. However, recent climate changes are unequivocally due to human activity and are accelerating due to the release of greenhouse gas emissions (GHG) and other activities. As the effects of accelerated global warming grow, the risk of climate-induced displacement through disaster escalates.

According to the Intergovernmental Panel on Climate Change (IPCC), human activities have unequivocally caused global warming.[19] The World Meteorological Organisation reported that the annual average global temperature in 2023 was 1.45 ± 0.12 °C above pre-industrial levels.[20] Continued greenhouse gas (GHG) emissions will further increase warming. Projected GHG emissions make it likely that warming will hit the 1.5°C midpoint in the early 2030s; and possibly in the late 2020's under the highest emissions scenario.[21] The current emissions trajectory also makes it challenging to constrain warming below 2°C: if current mitigation policies continue, we are headed towards global warming of 3°C over the century, according to the UN Environment Programme.[22]

The underlying drivers of GHG emissions include unsustainable fossil-fuel energy usage, land use practices and patterns of lifestyles, consumption and production across individuals, regions, and countries. Anthropogenic climate change is already causing sea level rise and impacting weather and climate extremes - leading to losses and damage that disproportionately affect vulnerable communities. Global climate projections include intensified global water cycle variability – leading to more severe floods and droughts, global monsoon precipitation and tropical cyclones, extreme variable weather patterns, heatwaves, fire weather, and increased ocean acidification and deoxygenation.

Furthermore, continuing sea level rise is now unavoidable due to ongoing deep ocean warming and ice sheet melt, with sea levels expected to remain elevated for thousands of years. Relative to 1995–2014, the likely scenario for global mean sea level rise by 2100 is 0.28–0.55 meters, with the potential for much higher levels. Current 1-in-100-year (or, 1% probability in any given year) extreme sea level events are projected to occur at


2 million - 70,000 years ago
70,000 - 12,000 years ago
12,000 years ago - 2023
The contemporary age of migration started around 12,000 years ago at the end of the Ice Age and the beginning of the Holocene. With the planet warming and ice melting, vast areas became lush, providing abundant food for humans and other animals.
These circles represent the movement of people, rather than an exact location of settlement.

Fig. 3. History of Global Migration

Fig. 4. Extreme Heat Sign
Death Valley

least annually in over half of all tide gauge locations by 2100, while risks to coastal ecosystems, populations, and infrastructure will continue to escalate beyond 2100.[23] Over the next 2000 years, global mean sea level is projected to rise by about 2–3 meters if warming is limited to 1.5°C and 2–6 meters if limited to 2°C. Due to uncertainty associated with ice-sheet processes, global mean sea level rise of 2 meters by 2100 and in excess of 15 meters by 2300 (under the very high GHG emissions scenario) cannot be dismissed. Additionally, the IPCC could not rule out sea level rise of 5 meters by 2150.[24] Flooding and storm surge in coastal and low-lying regions are further exacerbated by complex scenarios, including subsidence in river deltas, which are home to some of the world's largest cities.

Climate change risks are becoming increasingly complex and more difficult to manage, with compounding and intersecting climatic and non-climatic risk. For example, biodiversity loss in land, freshwater and ocean systems, decreasing food production and variations in water availability lead to increased risk of food insecurity.[25] This is compounded by competition for land between urban expansion and food production, competition for resources, displaced populations, conflict, and pathogens. Increases in heat-related human mortality and morbidity, food-borne, water-borne, and vector-borne diseases and increased mental health challenges will all place populations at increased risk.

There are two courses of required action regarding climate change: slowing its dynamic through mitigation (emission-reduction) measures and adapting to changing conditions. Future success in reducing GHG emissions will not prevent the ongoing effects of climate change. Therefore, mitigation and adaptation must progress simultaneously. While adaptation planning and implementation have progressed across sectors and regions, responses are fragmented and unequally distributed, with existing gaps growing, along with evidence of maladaptation, particularly affecting marginalised groups.[26] The reality is that all or parts of an increasing number of villages, towns, and cities, will no longer be viable places for human occupation. We will need to adapt accordingly to the uncertainties of climate change to survive the unprecedented levels of risk our human settlements face.

1.3 Global Approaches to planned relocation

At the end of 2022 there were an estimated 71.1 million internally displaced people (IDPs) globally, with 8.7 million of these displaced by disasters, marking a 45% increase from 2021.[27] The International Organisation for Migration (IOM) estimates that between 250 million and one billion people will need to undertake a form of climate-induced human mobility by

Fig. 5. Bushfire Smouldering in Australian Outback

2050.[28] With the frequency, intensity and severity of climate impacts on the rise, an increasing number of countries are recognising the need to move communities out of harm's way.

Planned relocation has received interest and support in policy development at an international level. This includes the Nansen Initiative's Protection Agenda in 2015, which endorses "improving the use of planned relocation as a preventative or responsive measure to disaster risk and displacement."[29] The Platform on Disaster Displacement (PDD) is further developing these recommendations, focusing on supporting policy development and mapping planned relocation in the context of disasters and climate change.[30] The Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) identified planned relocation as a form of mobility with the potential to help people adapt to the adverse effects of climate change. The Task Force on Displacement (TFD) was established in 2015 at COP 21 to "develop recommendations for integrated approaches to avert, minimise and address displacement related to the adverse impacts of climate change", including planned relocation.[31] The Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR), of which Australia is a signatory, references planned relocations in the context of strengthening disaster risk governance, contending it is important "to formulate public policies, where applicable, aimed at addressing the issues of prevention or relocation, where possible, of human settlements in disaster risk zones, subject to national law and legal systems."[32] Numerous other international actors and NGOs have also advocated for planned relocations to be incorporated into global processes and documents, including IOM's work in building an evidence base and developing materials to support planned relocations.[33]

The United Nations High Commissioner for Refugees (UNHCR) published *Guidance on Protecting People from Disasters and Environmental Change Through Planned Relocation* in 2015, followed by *A Toolbox: Planning Relocations to Protect People from Disasters and Environmental Change* in 2017.[34] The International Federation of Red Cross and Red Crescent Societies (IFRC) also released *Planned Relocation in the Context of Disasters and Climate Change: A Guide for Asia Pacific National Societies* in 2021.[35] The IFRC framework outlines planned relocation stages as *pre, during and post-relocation*, emphasising the importance of effective planning, implementation, and sustainable resettlement.

This is evidenced in national planned relocation guidelines that have been produced by the Solomon Islands and Fiji's 2018 *Planned Relocation Guidelines – A Framework to Undertake Climate Change Related Relocation*. Both Pacific nations in the crux of

climate displacement have structured their guidelines around stages focused on community-centred, humanitarian, and equitable responses. The Solomon Island framework is a living document, reflecting the ongoing nature of risk and the need for policymakers to continually support relocated communities throughout and after the resettlement process. To ensure that the document embodies the current social, environmental and political context of relocation, it is reviewed every five years after consultation with stakeholders.[36] Fiji developed standard operating procedures for planned relocation, to support the successful operationalisation of guidelines.[37] These align with Fiji's sustainable development goals, including gender equality, rights of people living with disabilities, the elderly and marginalised groups and in doing so address the intersectionality of risk.

Key themes emerging from these frameworks include the importance of determining set timelines and measures to address issues that will likely occur and placing emphasis on availability of sufficient, sustainable funding.[38] Pacific countries have continuously called for a dedicated Loss and Damage Finance Facility to address both the economic and non-economic losses and damages associated with climate change and its impacts, of which planned relocation and resettlement is a key feature.[39] At COP27 in 2022, Parties agreed to establish new funding arrangements for assisting developing countries that are particularly vulnerable to the adverse effects of climate change in responding to Loss and Damage, including establishing the Loss and Damage Fund. While the COP28 Loss and Damage finance decision operationalised the Loss and Damage Fund and funding arrangements, several processes still need to be completed before Loss and Damage funding can be dispersed.[40]

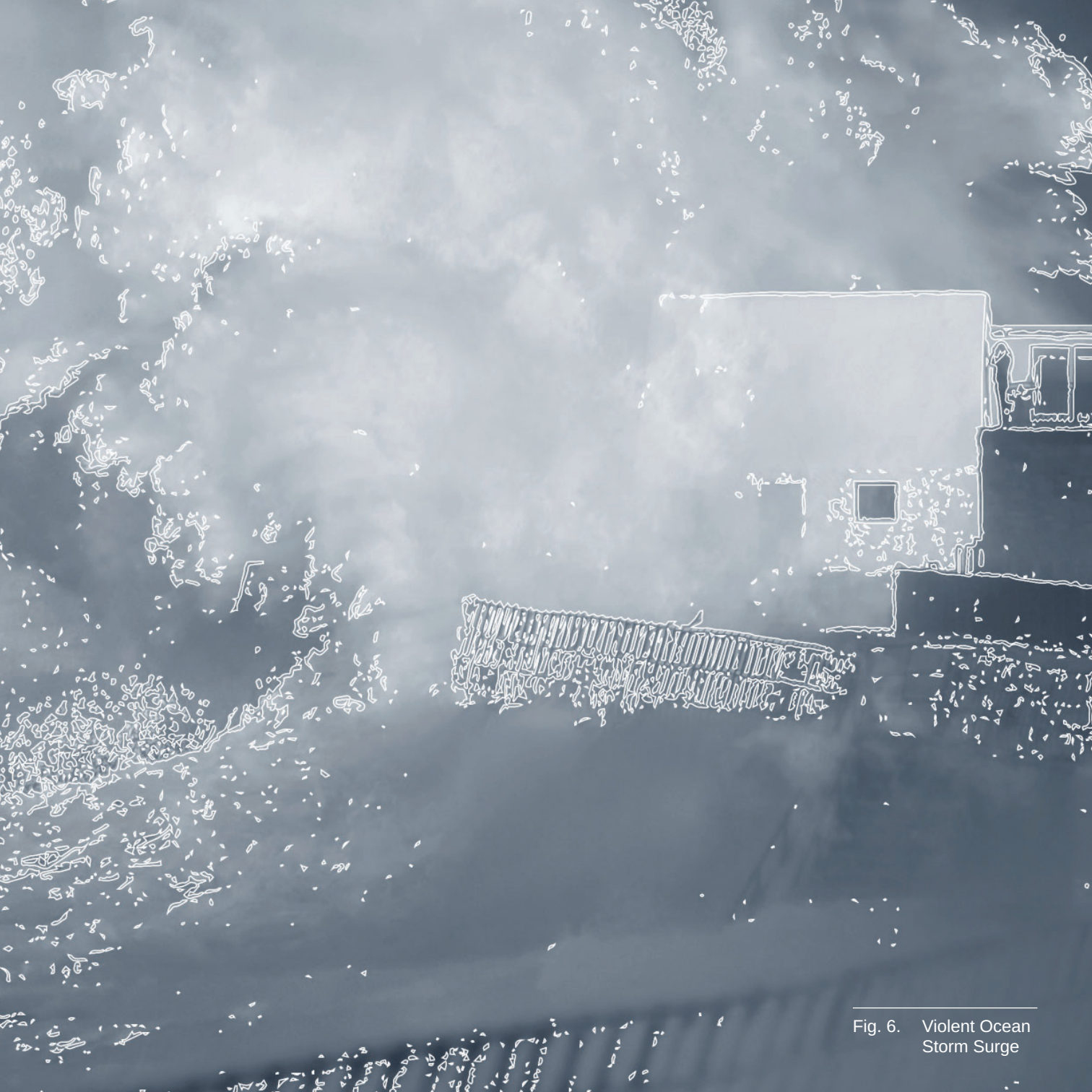


Fig. 6. Violent Ocean Storm Surge

Fiji, comprising more than 300 islands with a population of approximately one million, faces significant vulnerability to climate change impacts, particularly due to low-lying areas and its exposure to tropical cyclones. The aftermath of Cyclone Winston in 2016 prompted the Fijian government to establish Planned Relocation Guidelines in 2018. Since 2016, twelve additional cyclones have struck Fiji, causing severe negative consequences across environmental, social, cultural, and economic dimensions.

The recurrent cyclonic events, expected to persist at their current frequency but with increasing intensity, contribute to high levels of widespread damage and loss of life. Coupled with heavy rainfall and rising sea levels, these events heighten the risk of severe and more frequent flooding. As a result, numerous coastal communities in Fiji are poised for relocation in the near future, with the government identifying over eight hundred vulnerable communities and forty-eight in urgent need of relocation.

The relocation process has already commenced, with Vunidogoloa on the island of Vanua Levu being the first settlement to undergo this transformative move. Vunidogoloa was grappling with a history of coastal flooding and erosion, which, together with sea level rises and heavy rains inundated homes and destroyed crops. Discussions about moving were initiated in 2004 and by 2006, the community of 150 residents approached the provincial government seeking assistance for relocation. The relocation of Vunidogoloa to higher ground was successfully completed in 2014, marking a crucial step in addressing the community's vulnerability.

However, challenges emerged during the relocation process. Despite government assurances, the promised construction of new houses with kitchens did not materialise. In response, villagers took matters into their own hands, using salvaged materials from their abandoned homes to build kitchens for their new houses. Another challenge involved securing land for crop cultivation. Although the relocation presented cultural challenges for the families involved, it stands as a testament to proactive efforts in addressing the imminent threats posed by climate change.[41] [42]

Fig. 7. Fiji Cyclone Relief

Hurricane Sandy, at the time the largest Atlantic hurricane on record in terms of diameter, struck the East Coast of the USA in October 2012, causing nearly $70 billion in damage. New York, in particular, bore a significant brunt with 17% of the city being damaged, leading to extensive dysfunction. Since then, the city has faced exposure to an additional twenty-five hurricanes and tropical storms, though none as severe as Sandy.

New York already experiences severe flooding, particularly affecting low-lying and low-income communities. In response to these challenges, individuals with financial means opt to relocate to more secure areas. Currently, nearly 1.7 million people, constituting 20% of the city's population, reside within or adjacent to the extended, vulnerable coastal floodplain estimated for 2050. Approximately 400,000 individuals in these areas, primarily in low-income neighbourhoods, are at risk of displacement due to storm surges, coastal flooding, and rising sea levels. While post-Sandy funding has been allocated to rebuilding and recovery, the focus on the crucial issue of relocation has gained traction only recently.

The Rebuild by Design initiative in collaboration with Milliman, an international actuarial and consulting firm based in Seattle, has been actively studying risks, the impacts of flooding, population displacement and strategies for relocating residents to safer areas within the city. Even before the arrival of the next major disaster, New York is grappling with a housing emergency. For the city, the question is not whether to relocate or not, but when to take decisive action in the face of an increasingly uncertain and vulnerable future.[43]

Fig. 8: Aerial View of Breezy Point

Indonesia's capital city Jakarta, situated on the island of Java, is one of the world's most densely populated cities and faces significant threats from climate change. With a population exceeding 30 million, this sprawling mega-city grapples with severe pollution, perpetual traffic congestion, regular flooding, and earthquakes. Adding to its climate vulnerability, Jakarta is one of the fastest sinking cities globally due to continuous extraction of groundwater. Since 1978, parts of the city have subsided by up to 4 meters, heightening its susceptibility to recurrent flooding from rain and high tides, tsunamis, and coastal surges - events expected to increase in frequency due to climate change.

In response, President Joko Widodo unveiled plans in 2019 to establish a new capital city named Nusantara in East Kalimantan, located on the island of Borneo. Kalimantan is four times larger than Java and is strategically located in the country's centre. The aspirations for Nusantara are ambitious, with plans that the city will be powered by renewable energy, transforming it into a technologically advanced hub fostering a new green economy and work culture. Nevertheless, this endeavour presents its own set of environmental challenges, including biodiversity and natural habitat loss from deforestation and the displacement of indigenous communities. Moreover, ensuring water security for a burgeoning population and adapting to potential extreme climate events such as droughts and wildfires remain pressing concerns.

Indonesia's announcement to relocate their political capital is one of the first examples of a central government-sanctioned, methodical, large-scale migration in the modern Anthropocene era. However, the city's construction requires clearing vast areas of tropical rainforest and wildlife habitat, creating ongoing environmental impacts. Furthermore, socio-cultural problems may be exacerbated, particularly for indigenous communities such as the Dayaks. Historically, the Dayaks have faced displacement to make way for palm oil plantations, mining operations, and paper production. The construction of a new capital city is likely to intensify these challenges, leading to conflict and disruption of traditional ways of life for indigenous peoples. [44] [45] [46] [47] [48]

Fig. 9. Jakarta Skyline

2. THE CASE for a NATIONAL RELOCATION STRATEGY

In Australia, between 2008 and 2022, approximately 243,000 internal displacements have been attributed to disasters.[49] Disasters triggered by natural hazards pose a significant economic burden, costing the Australian economy an average $38 billion per year. This figure is projected to rise to $73 billion per year by 2060, considering factors such as population growth, climate change and escalating property values. For instance, the 2022 South East Queensland floods alone incurred estimated social, financial, and economic costs of $7.7 billion.[50]

The IPCC contends further climate change in Australia is inevitable, with impacts cascading and compounding across sectors. Socioeconomic costs of climate change in Australia have escalated, with extreme heat leading to excess deaths and increased rates of illness. Declining agricultural production and financial and emotional stress in rural communities have resulted from increased droughts, and significant costs associated with extreme weather events. Heightened coastal flooding from sea level rise combined with high tides and storm surges have impacted on cultural sites, traditions, and lifestyles of Australia's First Nations Peoples.[51] Given that over 85% of Australia's population resides within 50km from the coast, sea-level rise is already a major concern, expected to worsen in the future.[52]

The impacts of climate change are exacerbated by socio-economic stressors, including rising cost-of-living pressures, an affordability crisis in rental and home ownership, escalating insurance premiums and limited insurance availability in high-risk locations. The devastating floods in the Northern Rivers of New South Wales in February and March 2022 demonstrate the scale and complexity of the issue, revealing systemic institutional, governance and funding failures post-disaster. Locations such as Lismore are still in the slow process of recovery more than two years after the disaster, with many people remaining in temporary housing and unable to return home, reopen businesses, or access necessary funding for relocation (refer to the snapshot on Lismore).

2.1 Cascading and Compounding Risk

Australia is confronting cascading and compounding risks in the wake of shifting climate patterns, affecting

food, water, energy and health security, as well as infrastructure, built environments, community safety, lives and livelihoods.[53] For instance, the 2019-20 Australian Black Summer bushfires cost around $20 billion in total,[54] burned 5.8 to 8.1 million hectares, decimating the habitats of threatened species, destroying 3,000 houses and claiming 33 lives.[55] Moreover, an additional 429 deaths and 3230 hospitalisations from cardiovascular or respiratory conditions were linked to the fires. Health costs were estimated at AUD $1.95 billion, with insured losses estimated at AUD $2.3 billion and additional losses in tourism, hospitality, agriculture, and forestry estimated at AUD$3.6 billion. In addition, Australia's greenhouse gas emissions doubled.[56]

These cascading and compounding risk scenarios exacerbate existing stressors and constrain adaptation options. Addressing these challenges requires new knowledge on system complexity and risk management to navigate uncertainty moving forward, with priorities according to the IPCC including:

> "a greater understanding of impacts on natural system dynamics; the exposure and vulnerability of different groups within society, including Indigenous Peoples; the relationship between mitigation and adaptation; the effectiveness and feasibility of different adaptation options; the social transitions needed for transformative adaptation; and the enablers for new knowledge to better inform decision-making (e.g., monitoring data repositories, risk and vulnerability assessments, robust planning approaches, sharing adaptation knowledge and practice)."[57]

2.2 Current Approaches are Inadequate

The IPCC recognises a key challenge will be the inability of institutions and governance systems to manage the scale and scope of projected climate impacts, overwhelming the capacity to provide necessary policies, services, resources, and coordination to address socioeconomic impacts. While processes in Australia are strengthening across non-government organisations, businesses, communities and governments, the predominant focus has been on adaptation planning rather than on implementation, with current adaptation efforts incremental and reactive.[58] Effective adaptation requires a shift from reactive to anticipatory planning, coordination across levels of governance, sectors and institutions and sustained funding and strategic policy commitment.[59]

Since the 2019-2020 Black Summer bushfires, funding, and processes to increase hazard resilience -including the revamping of Australia's National Emergency Management Agency, the National Disaster Risk Reduction Framework and Commonwealth Disaster Ready Fund - have significantly improved. However sufficient, sustainable ongoing sources of funding limit Australian relocation attempts.

Currently, there is no overarching framework guiding planned relocation practiced domestically. In response, IAG commissioned a report in 2023 to explore enablers and barriers for planned relocation in Australia.[60] Furthermore, Suncorp Group and Natural Hazards Research Australia released a discussion paper in November 2023 calling

Fig. 10. Existing Relocation Examples

for a national conversation about assisted relocations. Policy ideas proposed include; the development of a national map of natural hazard risks; evaluation of a small number of assisted relocation planning trials building on buybacks already underway in QLD and NSW; participation of local councils in community co-designed trials to develop a plan for engaging with First Nations peoples; and a long-term plan for a natural hazards risk map to indicate zones to be considered for future infrastructure and housing upgrades, or funding for assisted relocation.[61]

The Insurance Council of Australia (ICA) has advocated for a resilience budget boost, proposing the establishment of an ongoing fund of $250 million per year by the Australian Government, matched by states and territories, to buy back and raise homes exposed to extreme flooding. This initiative aims at supporting approximately 750 families annually to relocate out of flood danger zones.[62] This is recommended in addition to the existing Resilient Homes Funds in Queensland and New South Wales and the $200 million per year for five years Commonwealth Disaster Ready Fund.

Models established to address these issues will need to be sustainable over time as climate impacts intensify, incorporating input from community, industry and not-for-profit sectors and supported by government initiatives and funding. In the absence of a national strategy, communities lack guidance and resources to take pre-emptive action. Australia will need to develop mechanisms facilitating sustainable relocation from high-risk areas, prioritising the preservation of lives, livelihoods, communities, and cultural identity.[63] [64]

2.3 Protecting Communities and Environments

Planned relocation emerges as a proactive and effective strategy for protecting communities from risks associated with climate change and environmental hazards, while also fostering economic and social well-being. It is crucial to acknowledge that poorly planned and underfunded relocation efforts may disproportionately harm marginalised communities.[65] [66] To ensure equitable and just implementation of planned relocation, First Nations guidance is important alongside community-led processes. The potential benefits of planned relocation, developed and managed within a community-led and supported framework, include:

- Enhancing public safety: Planned relocation can reduce risk to people and property, minimising extreme disruptions caused by enviro-climatic disaster events.

- Improving health and well-being: It has the potential to mitigate negative health and mental health impacts related to disaster events and anticipated disaster events.

- Strengthening community resilience and capacity building: It can scaffold community resilience and capacity building by reducing exposure to disasters, promoting the development of social networks, and fostering agency and shared purpose.

- Preserving natural ecosystems: It may aid in preserving and rehabilitating

natural ecosystems in environmentally sensitive or hazard-prone areas.

- Creating new economic opportunities: It has the potential to promote the development of new businesses, industries, and jobs in areas not subject to disaster events.

- Reducing building and infrastructure costs: It can lower construction and maintenance costs by reducing the need for costly repairs, upgrades, and reconstruction post-disaster events.

- Improving urban environments: It can facilitate improved urban environments through thoughtful planning, design, and construction, incorporating enhanced greenspaces, transportation, public spaces, housing typologies, materials, energy efficiency and healthy buildings.

- Improving resource security: It can enhance community access to fresh water and land for food production, bolstering resource security.

2.4 Strategic Value of Planned Relocation

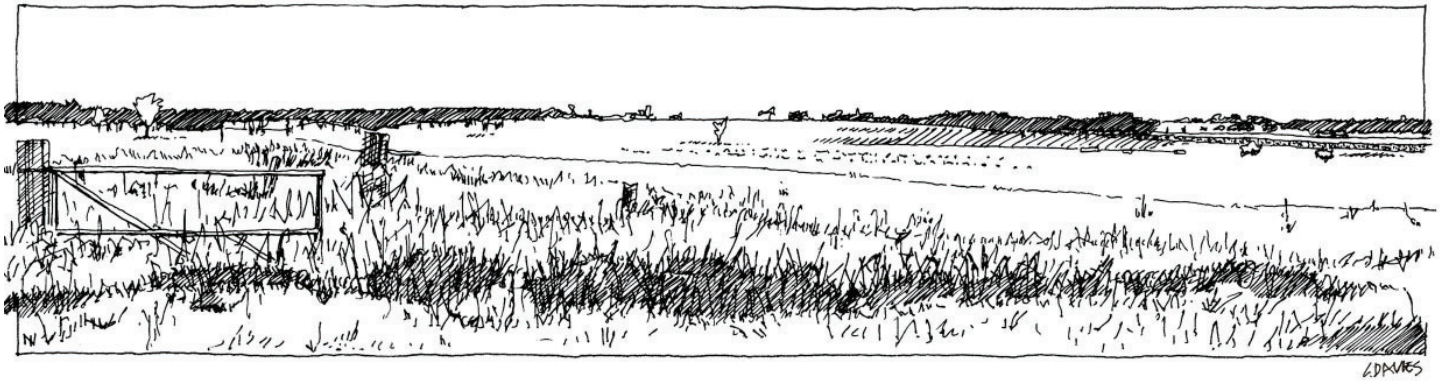
Climate change, food insecurity and conflict are expected to displace populations globally, potentially leading to significant border security issues. This blurs distinctions between Australian Defence Force (ADF) defensive and climate impact roles, contributing to a complex and evolving geopolitical landscape. The ADF outlined its position toward climate change in the 2023 Defence Strategic Review. An implication of the review is that civilian capacity to respond to climate-driven disasters needs to expand as the ADF increases its focus on regional security at the expense of domestic disaster response. Proposals to achieve this have included forms of a ‘national civilian service’ and the redirection of existing government employees in disaster response.[67] [68] However, this approach will likely be insufficient in the face of an ongoing climate crisis punctuated with extreme events. A National Relocation Strategy is increasingly necessary to alleviate the need for repeated defence responses to climate-driven disasters, scaffold civilian capacity, underscore the strategic importance of siting new settlements, ensure water, food and resource security and safeguard communities.

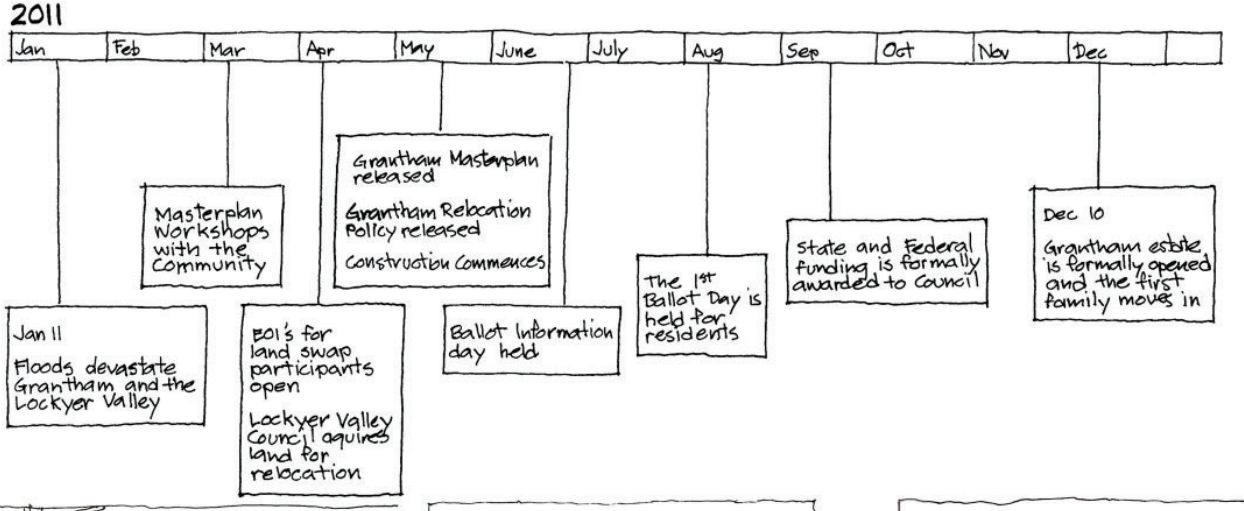
Situated within the Lockyer Valley in Queensland, Grantham supports a thriving agricultural community that is vital as one of the nation's primary food production hubs. In 2011, the Lockyer Valley faced a major flood, triggered by a severe storm that sent a wave of water down the Ranges from Toowoomba, devastating towns in its path including Grantham, situated on Lockyer Creek. The floods resulted in the tragic loss of twenty-one lives. In Grantham, nearly every house of the floodplain sustained structural damage, with 29 destroyed and 130 severely damaged.

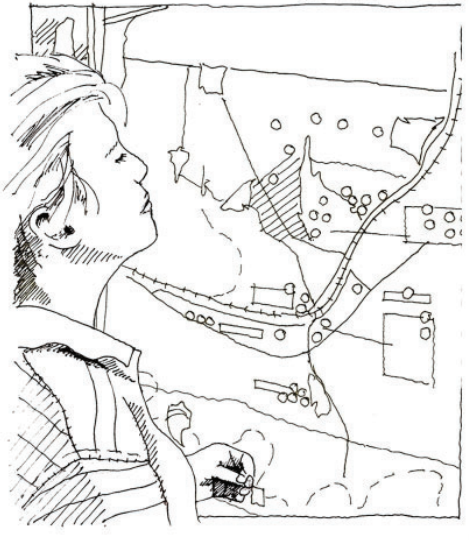
In response to these impacts, the Queensland Reconstruction Authority, in collaboration with the Lockyer Valley Regional Council, initiated the Grantham Development Scheme (GDS). Funding from both the federal and state government supported this comprehensive effort, which addressed future flood risk, the needs of disadvantaged community members, the devaluation of land and property and the availability of housing lots safe from future floods.

The GDS implemented new planning measures and acquired 377 hectares of land, which was subdivided into housing lots and designated for other community requirements. This allowed for the exchange of abandoned lots for more viable alternatives. The Queensland Reconstruction Authority expedited housing construction and the first families were relocated eleven months after building works commenced.

In meeting the immediate needs of the community, the relocation process was regarded as a success. However, it is essential to acknowledge that some individuals did not receive financial or relocation support and were left on the floodplain. The process represented a crucial step in addressing immediate challenges, but the need for sustained efforts and comprehensive solutions remains, especially for those who continue to reside in vulnerable areas.[69] [70] [71]







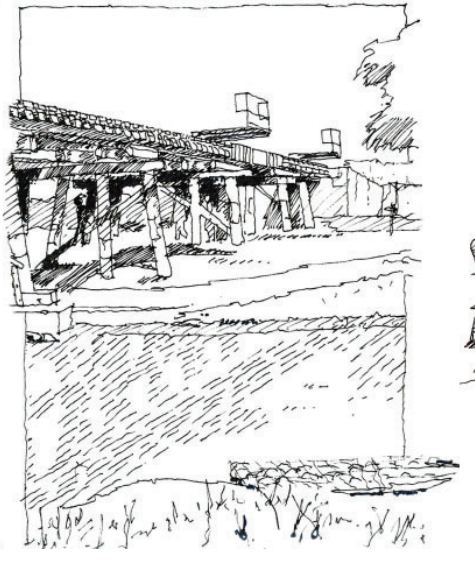


Fig. 11. Ink Sketches: Relocation Grantham by C.D. and J.S.

In the early hours of 28 February 2022, unprecedented flooding occurred across South-East Queensland, Northern NSW, and parts of Western Sydney due to extreme rainfall. Lismore, a regional city in NSW situated at the convergence of the Wilson's River and Leycester Creek, was particularly devastated.[72] Despite predictions of flooding, the scale and rapid rise of the waters caught many residents off guard, with floodwaters reaching 14.4 metres in some places, surpassing previous flood peaks by more than 2 meters. Approximately 31,000 people, out of a population of around 45,000 were affected. Adding to the catastrophe, a second major flood impacted the Lismore area on 30 March 2022, exacerbating the damage. The local First Nations community, the Widjabul people of the Bundjalung nation, was particularly badly impacted by the floods. However, their media organisation, the Koori Mail, provided and continues to provide a range of practical support and leadership for both First Nations people and the wider northern rivers community.[73]

The disaster highlighted inadequacies and malfunctions in rainfall and water monitoring systems, warning systems and institutional responses, which meant that the warning systems failed, leaving little time for evacuation or preventive measures. Lives were lost, people were forced onto their roofs and homes, businesses and infrastructure were destroyed.

Government assistance continues to be rolled out. Priority for buy-backs, house raising and retrofitting is based on the expected flood height and velocity in the most likely scenarios. However, the criteria for these measures rely on historical flood data rather than up-to-date information from 2022, causing uncertainty within the community. Some residents have received offers, while their neighbours have not, leading to confusion about the parameters being used. Initially, residents were informed that about 6,000 homes would be targeted under the scheme, but only 1,500 homes are now included. The process has been slow and disruptive. Approximately 1,100 homes are receiving offers in the first round, with 632 buyback offers made as of October 25, 2023. The shortage of available, affordable housing in the Northern Rivers exacerbates the challenges, making it extremely difficult for people to afford to re-establish their lives in the same area, even if a buy-back offer is made.[74] [75]

A recently announced agreement for 400 new homes located well above the Probable Maximum Flood (PMF) in Lismore aims to help alleviate the region's housing crisis. Of the 400 home sites "a number of the serviced lots will be made suitable for the relocation of existing homes from flood affected areas." [76] The agreement serves as an example of a cooperative approach to major new developments. Southern Cross University in Lismore has provided the 72ha site for this initiative. The New South Wales (NSW) Government will develop the site, including infrastructure provision, while the NSW Reconstruction Authority has allocated $15 million to facilitate the purchase of homes through the Resilient Homes Program before they are available on the open market. The houses are anticipated to be available for sale from 2026.[77]

Fig. 12. One of Many Damaged and Unliveable Houses six Months After the 2022 Lismore Floods

3. STRATEGIES and APPROACHES

Planned relocation is a complex process requiring a holistic societal approach, incorporating a broad spectrum of stakeholders including First Nations People, federal, state, territory, and local governments, industry, not-for-profit organisations, environmental groups, landowners, business owners, community groups, and individuals. Developing a comprehensive strategy for planned relocation will require a multifaceted approach, starting with establishing criteria for relocation. Once a site has been identified as requiring relocation, a suite of relocation scenarios would be developed, each necessitating tailored responses. Central to the strategy will be prioritising community agency to ensure that the needs and preferences of affected populations guide planning efforts. The adoption of a new approach to mapping - dynamic vectorial mapping- is crucial for detailed geographic and risk analysis, facilitating precise and informed decision-making against specific criteria.

Foresight and pre-emptive planning ensure that future challenges and opportunities are anticipated, and that communities are prepared before emergencies escalate. Finally, in selecting destination sites, careful consideration would need to be given to environmental sustainability, infrastructure, economic prospects, and social compatibility to support the long-term resilience and prosperity of relocated communities. Each of these factors would collectively contribute to a robust and effective relocation strategy and are discussed in more detail below.

3.1 Establishing Criteria for Relocation

Decisions regarding planned relocation will be influenced by a wide range of factors. An important criterion for success depends upon the degree of risk averted, which correlates with the proportion of at-risk individuals successfully relocated away from harm's way. Mapping of risk over time contributes to the identification of the severity and frequency of hazards, as well as vulnerability and exposure of communities to these hazards. Other criteria include risk tolerance, land availability, and the willingness of community stakeholders to engage and participate in the process. Recently, the Australian Government Department of Climate Change, Energy, the Environment, and Water (DCCEEW) released a National Climate Risk Assessment: First Pass Assessment Report which includes a high-level assessment of the risks to communities and infrastructure. Some of the criteria used in this report are useful to the development of a relocation strategy[78].

While the immediate impacts of disasters are evident, their long-term effects on the environment, economy, society, and

psychology can be profound. Decisions related to relocation are complex and establishing the criteria for relocation will be a priority. Persuasive reasons, compelling evidence, and a robust legal basis will be necessary for undertaking planned resettlement,[79] as emphasised in Fiji's Planned Relocation Guidelines, which acknowledge that "planned relocation within Fiji does represent an option of last resort."[80].

The form, scale, timeframes, and logistics of planned relocation will be complex and unique to each location. There are multiple relocation scenarios that will likely occur dependent upon local social, environmental, and economic conditions. These scenarios include but are not limited to:

1. Partial relocation, where an existing settlement spans low and high-risk areas.

2. Relocation of one or multiple sites to a single destination greenfield location.

3. Relocation of a single site to multiple destination sites.

4. Relocation of one or multiple sites that combine with an existing settlement.

In most cases, the relocation process will be staged and protracted, with locally specific environmental, economic, social, cultural, and historical values to be considered.

3.2 Community at the Forefront

Approaches to planned relocation should empower communities to envision and shape their own future environments. This process requires a comprehensive, whole-of-society approach, with decisions formulated, developed, and overseen within the affected community. The well-being of relocated individuals should be a central priority, with their perspectives and values incorporated at every stage.[81] [82]

Recognising that not everyone will be willing to relocate despite understanding the risks, planned relocation presents multifaceted social, economic, cultural, and logistical challenges. Effective relocation will require a comprehensive and integrated approach that addresses technical, legal, regulatory, and social complexities. This includes strategies such as robust communication, stakeholder engagement, scenario planning, alternative land use planning, site selection, design of new built environments, and financial and legal incentives to encourage relocation.

Drawing on diverse perspectives, local knowledge, scientific insights, and inclusive engagement processes enhances capacity and ensures locally appropriate and socially acceptable solutions.[83] Communities and individuals possess varying capacities, strengths, vulnerabilities, and access to resources. Prioritising equity and justice in planning and implementation, along with interventions addressing inequities based on income, gender, ethnicity, disability, age, and other factors, and allocating appropriate resources will be crucial elements of the planning process.[84]

3.3 Understanding, Mapping, and Communicating Risk in Time

While data on flooding, sea level rise, coastal erosion, heatwaves and fires, highlights the risks facing many Australian communities, conveying the full complexity of these risks is challenging through data alone. Rebuilding or retrofitting to withstand future impacts may be appropriate and viable in some locations, while relocation from high-risk areas may be necessary in others. To make well-informed decisions, governments, industry, and communities will need to comprehensively understand the risks through evidence-based risk mapping, guided by clear criteria established by the affected communities.

Currently, risk maps identify areas of Australia that are, or will be, exposed to such risks as flooding, sea level rise, or increasing temperatures and are critical in communicating data and projections on emerging risk.[85] [86] Traditional static risk maps, however, are limited in their capabilities to model the complexity of emergent and dynamic risk, as whatever is currently mapped is undergoing constant change. Further, risks are not discrete, as traditionally mapped: instead, they overlap and impact upon each other. Current data and images alone do not deliver sufficient evidence of intersecting and compounding levels of risk across climatic, environmental, cultural, social, and economic situations.

Vectorial mapping, which represents space, time, magnitude and direction of complex situations and their relational nature, offers a solution. Dynamic risk mapping outlines situations where risk is a moving process and where impacts of climate change interact with and exacerbate drivers of insecurity and instability. Risks can be recognised and pre-emptively engaged with before they materialise. This approach has strategic value for communities, industry, and policy makers, offering better projections of emerging enviro-climatic risks and informing timely strategic planning for safer futures. By representing risk in real-time and continuously revising strategic relocation planning, dynamic risk mapping facilitates dialogues with communities and supports engagement with risk across diverse stakeholders. It is proposed that this mapping initiative would be developed in collaboration with the ACS, NEMA, and other public and private agencies already involved in mapping risk.

3.4 Designing Back from the Future

Planned relocation requires designing-in-time to deal with current and future risk. Designing back from the future, rather than towards it, recognises that the future is not empty - it is full of the consequences of human activity on the planet, such as climate change, pollution, and environmental degradation.

Within this framework, planned relocation efforts will need to acknowledge that areas currently classified as low risk may transition into high-risk zones in the future. Adopting anticipatory and adaptive planning strategies is essential, focusing on future-oriented design approaches aimed at mitigating potential risks. Merely reacting to ongoing crises is insufficient, increasingly costly and endangers lives. Instead, risk

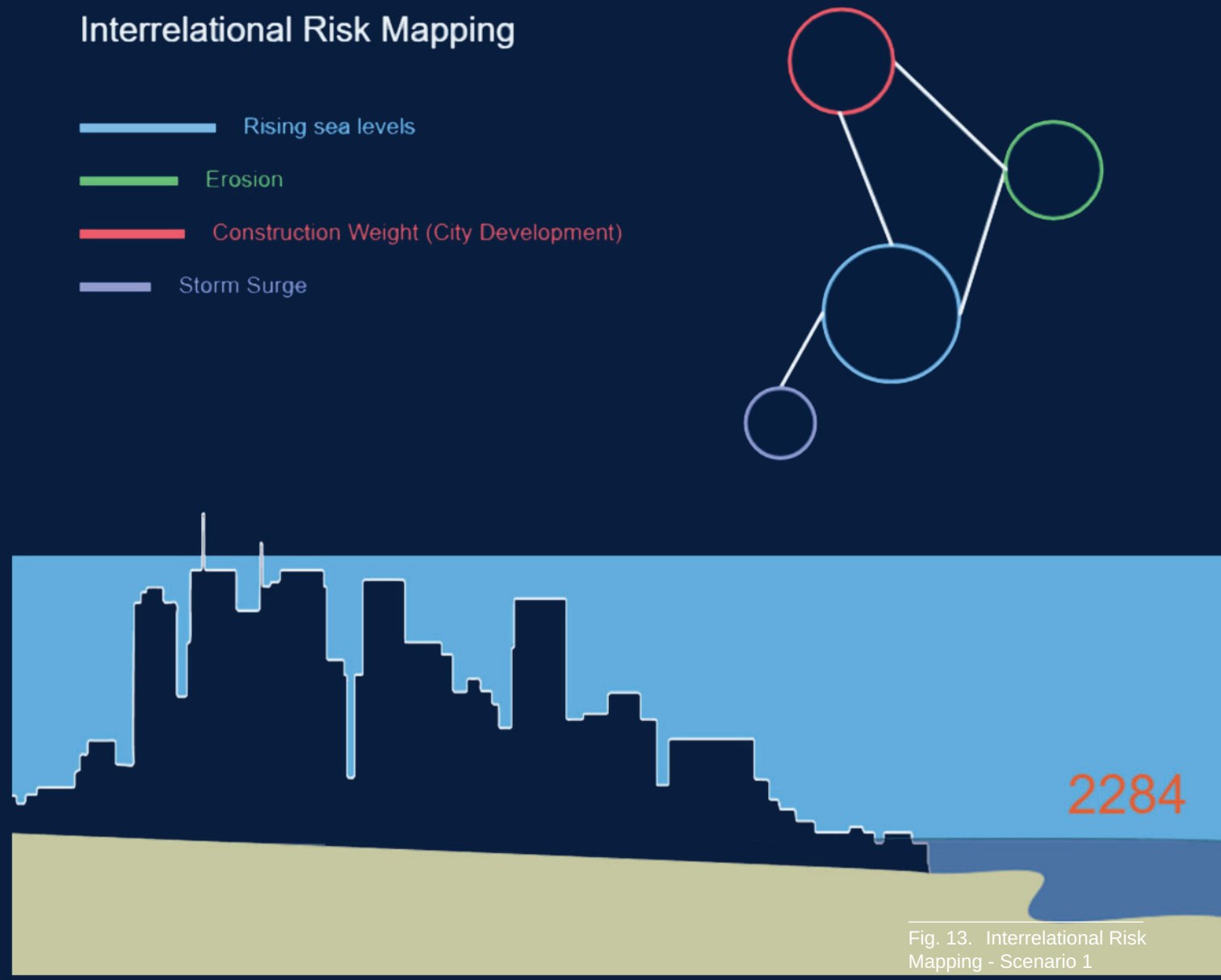


Fig. 13. Interrelational Risk Mapping - Scenario 1

Fig. 14. Interrelational Risk Mapping - Scenario 2

reduction through pre-emptive action is the cornerstone of responsible adaptation and relocation practices. This approach necessitates foresight, thinking in time and recognition of the long-term practical, economic, social, cultural, and psychological benefits of placing the safety of communities front and centre.

3.5 Viable Destination Sites

Identifying viable relocation sites, characterised by reduced risk and suitability in terms of geography, environment, and climate, is an essential initial strategic priority. Sustainable and successful relocation in the long-term hinges on communities being provided with suitable land, essential services, and infrastructure. These provisions are essential for communities to maintain or enhance sources of income, livelihoods and employment opportunities while preserving their cultural practices and values.[87] Moreover, destination sites will need to be attractive to the community, with their active involvement integral to every stage of the decision-making process. This approach will help ensure that the relocation is in line with the community's needs, preferences, and aspirations, fostering a sense of ownership and empowerment throughout the transition.

There will be requirements for rezoning of land and complex legislative issues relating to land tenure. With a few exceptions, state and local governments possess the authority to rezone or acquire land within their jurisdictions. Most acquisitions are for urban and infrastructure development and support commercial developers. Statutes outline these processes, which typically include provisions facilitating government flexibility and granting Ministers broad discretionary powers. Disputes typically revolve around compensation, although landowners often profit financially from these transactions.

Exceptions include federal land, reserved areas like national parks, land protected by legislation (e.g., containing endangered species), or subject to Native Title claims, notably Crown land (excluding certain state-owned areas such as some infrastructure and National Parks). Australia has historically followed English land law, with the state and federal governments having power over all land. However, the 1992 High Court decision in Mabo recognised Native Title, acknowledging in Common Law that First Nations people always had and continue to have rights in land and water. [88] Native Title applies unless extinguished by government actions such as selling or granting freehold. It affects approximately 40% of Australia, typically conferring non-exclusive rights over the land.[89]

States implement specific processes for major developments, such as NSW's Rezoning Pathways Program for developments of 'strategic importance'.[90] While these can be state-led, they have primarily been led by developers with state support. A significant challenge with large greenfield developments is the necessity for substantial infrastructure and the failure to provide this has stalled some proposed developments.

Rezoning alone does not render the land development-ready. Unless it is Crown or state land, property owners usually must agree to sell to developers or face compulsory acquisition by the state. Many of these land and zoning issues associated with major developments can be circumvented through negotiated agreements, as demonstrated by the 2024 East Lismore plan and the 2011 Grantham relocation (see the snapshots).

When relocation involves integrating with an existing settlement, a key issue to be addressed is the level of integration into the receiving or host community.[91] Early attempts to relocate Carteret Islanders in the 1990s highlighted this issue, as many families returned home due to a failure to integrate new arrivals within the host community.[92] Failures of ad hoc retreats are typically characterised by insufficient ongoing government funding and a lack of investment in adequate social and physical infrastructure to support the growing population.[93] Additionally it is crucial to ensure that the living standards of existing settlements are either maintained or improved throughout the process.

3.6 The Logistics of Planned Relocation

Planned relocation, encompassing people, economies, infrastructure, institutions and built environments, is a multifaceted and long-term endeavour. Within this framework, various relocation scenarios emerge, each presenting unique challenges. Some instances involve relocating only a small portion of a community, while others necessitate the relocation of entire communities. Some will transition to greenfield locations, while others will integrate with existing communities. The logistical process of relocation is intricate, entailing the establishment of a new site and subsequent migration over time. A sophisticated supply chain is vital to ensure the timely and accurate delivery of all items to their designated locations.

Preserving existing assets holds inherent value. In extensive relocation projects, careful consideration and coordination are required for relocating houses, structures, and infrastructure. The preservation of heritage structures and features plays a crucial role in both conservation efforts and maintaining community continuity. Where relocating complete structures proves impractical, opportunities exist for repurposing existing building components and recycling remaining materials for new construction at destination sites. The process of disassembly, reassembly and transportation will require careful coordination.

Furthermore, there will be a need for new housing, facilities, services, and infrastructure, leading to increased requirements for materials, skills, plant, and equipment. However, the availability and distribution of these resources may not align with the areas in need. Detailed planning is crucial for new site storage, material inventories, workforce selection, skill requirements and management transition between locations. Transportation modes and timing need to align with construction and storage

capacities at the new location. Therefore, quantifying and mapping available resources is essential, with collaboration from industry and government associations to produce resource registers. These efforts should be integrated with ongoing risk mapping processes. By correlating communities at risk with the location of projected resources, an audit process can be undertaken, and a supply chain strategically planned for feasible action scenarios.

Adapting social and economic structures to the new environment, preferably before relocation, is paramount. Careful logistical consideration is essential in deciding what to move and how to move it.[94] Conservation of resources, waste minimisation and protection of cultural values are paramount, as is ensuring operational continuity during institutional and workplace transitions, such as schools, hospitals, and businesses.

3.7 Restoration and Repurposing of Evacuated Land

The repurposing of land and assets due to planned relocation requires a holistic approach that balances ecological restoration, community needs and sustainable development. In some cases, communities may prefer sensitive heritage, memorial, and cultural sites to remain in situ, requiring ongoing care and maintenance. Careful consideration is crucial for repurposing evacuated land, especially in partial relocation scenarios. Following relocation, land left behind is rarely repurposed for commercial benefit and left neglected, which can lead to the lowering of remaining neighbouring property values.[95] Therefore, it is essential to consider appropriate rezoning, restoration, and repurposing of this land for alternative uses such as nature conservation, provision of ecosystem services, agriculture, tourism, recreation, or other low-impact purposes. Additionally, the potential for adaptive reuse of remaining buildings for alternative low-risk non-residential purposes should be examined. Further, provisions will need to be in place to support community members who choose not to relocate, ensuring ongoing access to necessary services and facilities.

Critical considerations for equitable, just, and inclusive restoration include identifying and preserving heritage sites, recognising the land's role in maintaining community identity and ensuring equal access to resources and benefits from repurposed land. Additionally, creating community spaces, green spaces and promoting reforestation, wetland restoration, habitat restoration, soil remediation and water quality improvement are vital for environmental sustainability and resilience to disasters triggered by natural hazards. Developing sustainable agriculture practices, renewable energy projects and recreational/educational opportunities on abandoned lands can further contribute to regional sustainability while fostering a culture of conservation.

3.8 Socioeconomic Benefits of Relocating to a Safer Place

Addressing the socio-economic issues associated with planned relocation necessitates a balanced approach, acknowledging the intricate interplay between economic, environmental, and social factors. Through careful planning, collaboration, and innovation, it is possible to transform challenges into opportunities for sustainable economic development.

The significant upfront costs of planned relocation should be viewed through two distinct timeframes. Firstly, considering the economic, social, and psycho-emotional costs of not relocating—essentially losing everything. Secondly, assessing the costs of relocation, including economic, social, and psycho-emotional aspects, offset by benefits accruing over time. These benefits stem from various community investments—economic, physical, mental, and emotional. While acknowledging the pain of loss, the potential of relocation should be communicated clearly and embraced as an opportunity.

There are many potential opportunities and benefits. Benefits of moving to a safer, less stressful environment include reduced exposure to risk and the consequences of environmental disasters on everyday life, well-being, health, and the local economy. Relocation presents an opportunity for economic innovation and the renewal and enhanced provision of social, cultural, health and educational facilities. Relocation to a lower-risk environment should lead to more affordable insurance costs and minimised repair expenses from disasters triggered by natural phenomena. Carefully planned large-scale relocation has the potential to generate employment opportunities, diversify local economies, attract tourism and investment, stimulate economic growth and with local and government support foster research, training, and educational opportunities. Additional opportunities include new industries for relocation, reuse and recycling of existing built environments and restoration of existing sites. The process has the potential to encourage innovation and the development of knowledge and skills, while fostering information sharing between and within communities.

3.9 Institutional Support, Funding, and Planning

The most successful relocation programs are anticipatory rather than reactive.[96] To ensure successful relocation, appropriate pre-relocation measures will need to be in place, including sufficient funding, detailed action plans and community participation.[97] This ensures efficient and equitable allocation of resources, preventing haphazard decision-making based on limited resources available during disasters. Without these considerations taken into account in the pre-relocation process, communities may face detrimental impacts, leading to decreased uptake by residents. For instance, in the case of relocation in Newtok, Alaska, issues including a lack of public services and a school at the destination site caused delays. Families chose not to

relocate until a school was built, while the district delayed building a school until twenty-five families relocated.[98] Such stalemates should be avoided for smooth transitions and mutual trust between governance, stakeholders, and community. To achieve this, mechanisms will need to be in place prior, during and following relocation to ensure ongoing and meaningful participation in decision-making within the community.[99] [100] [101] This includes effective communication across all stakeholders, providing updates on progress, budgets, emerging issues, and responses to problems.

Another important consideration is ensuring an adequate supply of housing, services, and infrastructure throughout the relocation process.[102] Following the recent floods in Queensland (QLD) and NSW, institutional approaches are emerging to support and fund house relocation and modification. Examples include the QLD Resilient Homes Fund[103] and the NSW Northern Rivers Resilient Homes Fund,[104] each co-funded by the Australian Government and state governments. These initiatives highlight the significant challenges, costs and timeframes pertaining to modification or relocation, even for limited numbers of houses. (See the snapshots of Grantham and Lismore, above.)

Alignment at the different levels of government is crucial to ensure a consistent and coherent approach which responds to these challenges. Similar to the National Energy Transition Authority established in 2022[105] to address a policy gap in national planning, coordination and funding, a National Relocation Authority would collaborate with state, territory, and local governments, as well as communities, industry, and First Nations groups. This reflects the shared responsibility of all levels of government in assisting key regions and communities in managing relocation.

3.10 Alignment Between States and Territories

A robust framework for cooperation between the Commonwealth and state and territory governments, outlined in a National Relocation Strategy and overseen by the National Relocation Authority, would address the interstate challenges in relocation. Australia's federated system requires alignment of relocation strategies across various jurisdictions to enhance efficiency and fairness, ensuring broad access to relocation options for communities. National-level strategic policies and incentives are crucial for coordinating a unified approach to relocation across different levels of government.[106] The Commonwealth is uniquely positioned to coordinate and guide state and territory practices concerning relocation. By facilitating complex stakeholder, resource, and policy alignment, as it already does through institutions such as NEMA, the Department of the Prime Minister and Cabinet, and the National Cabinet, the Commonwealth can ensure efforts are not duplicated, best practices are consistently adopted, and national resources for relocation are optimally utilised.

The effective management of relocation in Australia is also intricately tied to the constitutional powers and financial responsibilities distributed between the state and federal governments. While states have authority over planning and development, the Commonwealth often shoulders a large portion of the financial burden of disaster recovery. These challenges highlight the need for a strategy that addresses the current variability between different jurisdictions' approaches to relocation.[107]

NSW has initiated the development of a state policy for large-scale multi-hazard managed relocation, drawing on the Northern Rivers' experience, under the NSW State Disaster Mitigation Plan 2024.[108] The policy will be delivered by the NSW Reconstruction Authority and the Department of Planning, Housing, and Infrastructure by mid-2025. However, other states lack similar initiatives in their disaster management, response, recovery, and/or resilience plans.[109] [110] [111] [112] [113]

NSW and QLD Reconstruction Authorities have recently implemented home buyback schemes through the Resilient Homes Program and Resilient Homes Fund respectively.[114] [115] However, these schemes are limited in scope and location. They have been introduced following disasters and have not been incorporated into a broader state-wide pre-emptive and strategic risk-based approach to relocation. These disparities in approaches between states underscores a significant gap in policy coherence. Consultations for the soon-to-be-released National Adaptation Plan have identified assisted relocation as a pivotal cross-cutting issue, necessitating clear role definitions and coordination across the country.[116]

The establishment of a National Relocation Authority would be pivotal in this context. Serving as an independent custodian of the National Relocation Strategy, it would ensure continuity and consistency across various electoral cycles, which is essential given the politically sensitive nature of relocation. The Authority would facilitate institutional connections between federal and state agencies engaged in reconstruction and planning, thereby improving communication and cooperation. Additionally, it would instil greater confidence in the building and development industry across Australia.

3.11 Establishment of a National Relocation Authority

A National Relocation Authority would be established to execute the National Relocation Strategy and provide coordination and assistance to states, territories, local authorities, communities, and individuals throughout the relocation process. This Authority would develop a framework to optimise relocation planning, expertise, knowledge sharing, resource allocation, and the establishment of common legal and financial processes. Additionally, it would identify and establish suitable governance and support services. Working groups would be appointed to develop the structure, terms of reference, and operational model of this authority.

Local community relocation efforts require support and management across various areas, including risk data gathering, land acquisition, legal matters, coordination across states and councils, resource management, social support, financial assistance, economic planning, and technical aid. While state Reconstruction Authorities, such as those in Queensland and NSW, are addressing some of these aspects in key locations, coordinating these efforts within a coherent National framework would maximise knowledge sharing, expertise, resource allocation, and the establishment of common legal and financial processes and support services.

The functions of the National Relocation Authority would reflect those of the recently established National Energy Transition Authority.[117] This independent statutory authority possesses the necessary powers to steer the energy transition, safeguarding workers and communities while maximising the opportunities and benefits of a zero-carbon economy. Similarly, the National Relocation Authority would be endowed with funding, advisory, and potentially regulatory functions, guiding the development of plans at both state and regional levels. Given the critical importance of these issues to Australia's future, reliance solely on market forces is inadequate, necessitating long-term development through appropriate authorities.

Central to the success of relocation efforts is adequate funding. Government funding for disaster recovery is often insufficient and delayed, imposing financial burdens. While reaching agreements with insurers to contribute relocation costs is conceivable, many individuals in high-risk areas struggle to afford insurance or encounter limitations in coverage, exacerbating the 'insurance protection gap.' Additionally, numerous households and communities lack the savings for independent rebuilding efforts. Exploring innovative financing approaches for relocation, including government funding, private investments, and public-private partnerships, as well as addressing barriers to the use of insurance for relocation and funding essential risk reduction measures, is imperative.

4. KEY CONSIDERATIONS

The following points highlight some of the complexities that need to be addressed when developing a National Relocation Strategy:

- **Complexity in Types of Relocation:** Identifying the most appropriate scale, form, and stages of planned relocation for individual communities at risk.
- **Learning from First Nations Knowledge and Perspectives:** Ensuring that First Nations knowledge is part of discussions regarding planned relocation.
- **Community Engagement and Participation:** Ensuring that the community is central throughout all stages of the relocation process, from early conceptualisation to post-relocation, is vital. Prioritising equity, justice, and inclusivity.
- **Addressing Societal and Intergenerational Concerns:** Acknowledging that there will be many people who do not want to relocate, notwithstanding their knowledge of risk.
- **Addressing Culturally Sensitive Concerns:** Deciding what is to be relocated and what will remain is complex and sensitive, requiring difficult decisions to be addressed within the community. This is particularly important for sensitive heritage, memorial, and cultural sites.
- **Facilitation of Community Led Design Processes:** Ensuring that the planned relocation design process is inclusive of First Nations and all voices and perspectives from the affected communities, environmental experts, urban planners, engineers, architects, and designers underpinned by technical, scientific, legal, and regulatory expertise.
- **Scaffolding Community Capacity:** Identifying existing skills and expertise within the community needed for planned relocation and ensuring the community is appropriately supported throughout the process.
- **Understanding, Mapping and Communicating Risk in Time:** Recognising risk as a dynamic process where the impacts of climate change interact with and exacerbate drivers of insecurity and instability over time.

- **Identifying Viable Destination Sites:** Identification of low-risk sites that are geographically, environmentally, climatically, culturally, and socially suitable.
- **Land Acquisition and Tenure:** Addressing significant political and economic issues requiring complex legislation, including issues of rezoning.
- **Complexity of Logistics Planning:** Carefully sequencing and facilitating the planned relocation of people, economies, infrastructure, institutions and built environments over extended periods of time.
- **Relocating, Repurposing and Recycling:** Understanding the inherent value of existing assets and considering them as valuable resources.
- **Restoration of Evacuated Land and Properties:** Considering appropriate restoration and re-purposing of evacuated land and buildings for alternative uses, such as agriculture, tourism, recreation, or other low-impact, low risk non-residential uses.
- **Contingency:** Ensuring provisions and contingencies are in place to support those who chose not to relocate.
- **Economic Futures:** Offsetting the cost of relocation and ensuring that planned relocations will provide economic benefits to community, industry, and the economy over decades.
- **Ensuring Institutional Support:** Consistent institutional support across government, private and not-for-profit sectors.
- **Appropriate Funding and Mechanisms:** Ensuring appropriate and secure funding sources and measures are in place to enable a smooth transition through pre, during and post relocation.

5. KEY POINTS FOR DISCUSSION

Globally and nationally, addressing the scale of impacts, dangers, and challenges presented by climate change requires vision and imagination. A significant percentage of the Australian population live in areas that are and increasingly will be, exposed to the effects of escalating climate change including extreme weather events, riverine and coastal flooding and storm surges, sea-level rises, drought, fire, and extreme heat. Many communities will need to relocate out of harm's way in the coming decades and beyond. Establishing a National Relocation Strategy for communities at risk requires identifying how and where to initiate preventative action as well as designing a plan that acknowledges and encompasses cultural, social, environmental, economic, political, and institutional complexity. The implementation of such a strategy is increasingly urgent. In light of this, the following actions are suggested for consideration and adoption:

1. The Creation of a National Relocation Strategy for Australian Communities at Risk

A National Relocation Strategy for Australian communities vulnerable to the impacts of climate change, should be established. It must place the safety, dignity, and agency of individuals and communities at the centre. Such a strategy would include the development of a legal framework and adopting a whole-of-government approach for implementing planned relocation. Internationally and particularly in the Pacific Region, guidelines for planned relocation guidelines have already been developed. Given the exposure of many parts of Australia to the devastating impacts of climate change, the development of guidelines for planned relocation for at-risk communities is of crucial importance. A National Relocation Strategy would aim to:

- Prompt new visioning of Australia's urban and regional futures, particularly in areas deemed at considerable risk.
- Lay the foundation for dynamic risk mapping, depicting overlapping impacts over a range of timeframes.
- Build upon and strengthen community capacity in the context of relocation.
- Communicate the relocation strategy effectively within and across government, non-governmental organisations (NGOs), the private sector and the broader community.
- Stimulate policy discussions directed towards Australia's environmental and climatic future.
- Identify immediate and long-term societal, cultural, and economic costs and concerns associated with relocation.
- Identify immediate and long-term social, cultural, and economic benefits and opportunities resulting from relocation efforts.
- Address key environmental, cultural, heritage and legislative challenges, including site selection,

land acquisition, tenure and post-relocation land and site restoration.

- Consider key material aspects, such as relocation logistics, restoration, repurposing, recycling and requirements for new infrastructure, housing, and services.
- Identify appropriate governance structures at the Commonwealth, state, territory, and local levels, as well as institutional and non-governmental support mechanisms for local councils and communities.
- Explore innovative funding mechanisms and economic incentives to facilitate successful relocation endeavours.

2. The Establishment of a National Relocation Authority

The establishment of a National Relocation Authority would spearhead the development, coordination, and execution of the National Relocation Strategy, while collaborating with and aiding states, territories, local authorities, communities, and individuals throughout the relocation process. This Authority would collaborate with the ACS, NEMA, and state and local governments to identify communities most vulnerable to risk. It would spearhead relocation planning, resource allocation, and legal and economic processes, as well as identifying appropriate governance and support. A key component would outline recommendations and requirements for a facilitated, community-based process, encompassing statutory requirements, guidelines, funding, and support mechanisms, as well as modes of delivery before, during and after relocation. The Authority would appoint a series of inclusive working groups, representative of and drawing upon diverse knowledge sources, including First Nations and community representatives, a wide range of industry professionals, governance at all levels, humanitarian organisations, and researchers. It is proposed that a committee representing key stakeholders would collaborate with governments to define the structure, terms of reference, and operational model of this Authority.

3. Development of Dynamic Risk Mapping

The development of evidence-based dynamic risk mapping is important to recognise intersecting and compounding risks and complexity. Environmental, climatic, spatial, and vulnerability mapping that projects emerging and future enviro-climatic risks, serves to raise awareness of risk, establish dialogues within communities facilitating communication between government, industry, and community stakeholders, and informing strategic action to ensure community safety. At its core, this mapping process recognises risk as a complex and evolving phenomenon influenced by a multitude of variables. This Issues Paper advocates for the integration of risk mapping as a tool capable of

addressing the multifaceted nature of relocation scenarios. By juxtaposing and superimposing layers of significance, this methodology sheds light on the interrelationships between various risk factors. Ultimately, it would provide stakeholders with invaluable insights into the complexities inherent in the relocation process.

Developed in collaboration with the ACS, NEMA, and other public and private agencies involved in mapping risk, evidence-based risk mapping would play a crucial role in facilitating timely decision-making within communities facing escalating risk factors and in the selection of appropriate relocation sites.

4. Development of Resource, Skills, and Logistics Registers

The development of registers of public and private sector resources, infrastructure, available land, machinery and equipment, and supply chains for planned relocation. This correlates with the risk mapping process and includes identifying potential existing structures and materials available for relocation, reuse, repurposing, and recycling, as well as projected requirements for additional materials and resources related to planned relocation. Identifying existing skills and expertise within the community would enable the development of feasible scenarios based upon local knowledge. There will also be requirements, across the community, to develop new knowledge and skills in the context of relocation.[118] [119] Conducting an audit of the community's knowledge and skill base would aid in better understand its capabilities. Engaging the community in decision-making processes pertaining to the desired location and form of new settlements and in the identification of what should remain or be relocated is vitally important. Equally important is the identification of both material and non-material needs by the community.

This Issues Paper aims to stimulate discussion, initiate the development of a National Relocation Strategy for at-risk communities, and catalyse the creation of further research and practical initiatives. To address the issues outlined, collaboration is invited from government, industry, academia, and communities, with the aim of garnering support and establishing a network to expand upon and implement these proposals.

The Issues Paper and accompanying website represent initial efforts resulting from contributions by academic staff and students, and voluntary contributions from industry experts, alongside their professional commitments. Gratitude is extended to the Australian National University's Institute for Climate, Energy, and Disaster Solutions (ICEDS), the School of Art and Design at ANU, Mather Architecture, the Studio at the Edge of the World, and the University of Canberra (UC) for their financial and in-kind support of the project.

The authors encompass various disciplines including design, architecture, philosophy, science, disaster science, social science, risk and vulnerability, urban systems, and logistics. This transdisciplinary approach amalgamates the perspectives of like-minded individuals, and deliberately avoids a single-discipline approach from either the sciences or the humanities. Instead, it endeavours to convey the complexity of these issues to a diverse audience including policymakers, industry leaders, educators, media professionals, community organisations, and community members alike.

The project team will continue to develop this research, while striving to secure the resources necessary for implementation. It is acknowledged that there is much work to be done to advance this initiative, including a comprehensive review of existing and evolving government policies, both domestically and internationally. Establishing a consultation process that fosters collaboration among organisations addressing risk and relocation is imperative. The project website offers additional information and contact details for engaging with the project team regarding the initiative.

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