Griffith UNIVERSITY
Queensland, Australia

Barriers to the implementation of climate change adaptation plans and action

Considerations for Regional Victoria

October 2019

Purpose of this report

The research and findings (recommendations) presented in this report were developed by the Griffith Climate Change Response Program as per a request for information by the Victorian Department of Environment, Land, Water and Planning (DELWP) to better understand the barriers to effective climate change adaptation in regional Victoria. This report is a part of a collaborative series of works developed by Griffith University that explores best practice to manage and overcome the barriers to implementation, outlines the determinants of adaptive capacity and critical policy elements for regional consideration, as well as the social and cultural barriers to transformative adaptation success.

This information and advice are designed to be used by decision makers in a government, business and community context to assist with developing plans and priorities for climate change response. This report, and the others in the series, will be integrated with the *'Supporting our Regions to Adapt'* program and other programs on theory of change by the Victorian state government.

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VICTORIA State Government | Environment, Land, Water and Planning

Contents

1. Scope and limitations

This policy guidance brief considers barriers to the implementation of adaptation actions, with a specific focus on regional level adaptation in Victoria. In doing so it is intended to highlight a range of considerations for the design and roll-out of the Regional Victorian Adaptation Program by providing some further clarity on:

i. Key elements of best practice to manage and overcome the barriers to implementing successful adaptation throughout Victoria's regions;

ii. How state level governance can support the application of conceptual knowledge into place-based processes for successful adaptation.

In considering this policy guidance brief, it is important to understand two key limitations. The first is that adaptation as a practice is still very much in its infancy; while good progress on adaptation practice has been made to date, the fact remains that much of the reasoning and progress on adaptation is still evolving[5,14,26]. That said, there is an emerging body of work on barriers to adaptation that has been reviewed and considered for the development of this policy guidance brief[5,15,40]. The second limitation is that adaptation is implemented in contexts that are specific to the setting and sectors in which action is sought, and consequently highly dependent on the unique set of environmental, technological, economic, political and social-cultural circumstances, among others. This means that much of the transferable knowledge on barriers to adaptation tends to be generic and principal-based which is helpful for framing action, but difficult (and in some cases inappropriate) to directly re-deploy in different settings[14,16,17,24].

Key recommendations

1. **Use risk-based approaches to manage uncertainty:** Current thinking on adaptation and barriers to implementation are mostly generic and still evolving, which generates considerable uncertainty. This uncertainty is best dealt with by utilising standardised enterprise risk management frameworks for adaptation planning and action.

2. **Treat adaptation as a practice:** While the successful implementation of adaptation relies on good science and policy, the efficacy of adaptation plans and actions will ultimately be determined by our practices within specific places. Adaptation therefore needs to be treated as a practical problem, where improvements in practice are needed.

3. **Move beyond considering generic adaptation barriers:** Current knowledge on barriers to adaptation provide useful principles, but do not consider the local level complexities and dynamics that often determine success or failure. It is therefore critical to move beyond generic barriers towards more a tailored consideration of the adaptation challenges and opportunities unique to places.

4. **Address adaptation within the context of sustainable development:** Climate action sits within the broader goals of sustainable development. This means that adaptation should be considered as part of a broader efforts towards sustainable development. Doing this will likely increase partnerships for implementing adaptation.

2. Key conceptual considerations

2.1 What are governments' roles in adaptation?

A key role of governments in climate change adaptation is to provide information on climate change and the associated impacts, as well as good risk management actions in the form of policy, planning, service delivery among other things. Therefore, climate change adaptation requires not only a revision of how we arrange our social, technological and information resources, but also how we structure the institutional management and deployment of them. As outlined in table 1 Australia's governance of climate change adaptation (and mitigation) has broadly been categorised by the *National Climate Resilience and Adaptation Strategy (2015)* as requiring differing responses from our three levels of government[9,37,38]. For state government this suggests focusing on information dissemination, policy and regulatory development, funding distribution, intermediary communication between national and local governments, climate change framing as well as the development of state level objectives and priorities. Importantly, for many activities, implementing adaptation is seen as a responsibility of local governance where the state should play a supportive rather than active role such as facilitating relevant place or sector based support. However, there are exceptions, specifically in the instance where the state has established statutory authorities or government owned corporations to manage for example critical state-wide infrastructure or services i.e. water management[3,3,45,46].

Table 1: Council of Australian Governments (COAG) delineation of adaptation roles based on level of government.

Government level	Role in adaptation
Federal	• Funding research • Technological and scientific advancement • Protecting natural resources • Economic security and development
State	• Information dissemination • Policy and regulatory development • Funding Distribution • Intermediary communication between national and local governments • Climate change framing and state objective development
Local	• Enacting local adaptive response • Prioritising adaptation within diverse suite of responsibilities • Identifying key stakeholders, values and limitations • Interpreting national and state climate change legislation, data and information • Capture any adaptation opportunities or benefits • Be innovative with funding and resources

Victoria's approach to climate change adaptation addresses all of the state-level requirements in table 1. For example, the Victorian *Climate Change Adaptation Plan (2017-2020)* seeks to address adaptation through development in policy and support to both sectors and regions, while implementation remains the responsibility of local government and regions.

In terms of supporting local and regional adaptation, the Victorian Government Regional Adaptation Program has identified implementation as a historical barrier to achieving effective regional adaptation outcomes and is facilitating the development of guidance materials to support regions on this issue.

2.2 Current thinking on barriers to adaptation?

Barriers can simply be defined as obstacles to achieving your objective, in the same way that a risk (as defined by ISO 31000 Risk Management) is an event that impacts on you achieving your objective[5,40]. In that sense there are many commonalities that can be shared between consideration of adaptation barriers and common risk management practice. In the case of implementing effective adaptation measures, peer-reviewed literature suggests that there are five (5) ***generic barrier types*** (see box 1)[5,29,40]. Generic knowledge on how these broad barrier types form, how we can manage them and how to overcome them is summarised within this brief. However, it is also clear that barriers to implementation are very context specific and in order to address such barriers, we need to move beyond a generic understanding of barriers towards a more detailed understanding of the enabling factors that lead to successful implementation of adaptation in specific places[3,14,18,25].

Place-based framing provides a good basis for going beyond the consideration of generic barriers towards a recognition that adaptation barriers are often an outcome of the unique structures, behaviours and principles that underlie our various communities and society more broadly. In addition, place-based framing encourages consideration of climate and related risks specific to places, which often unpacks a number of place-specific implementation challenges or barriers. In order to properly consider barriers, the relationship between implementation barriers and enablers also needs to be considered. This relationship is important because it may not always be possible to advance adaptation implementation by addressing barriers alone, whereas significant opportunity may exist to target enablers as key determinants for action[28,32,34,40,54].

Box 1: Generic barriers to effective adaptation

1. **Informational barriers:** associated with the development, useability of and access to information, data and knowledge.
2. **Governance and policy barriers:** associated with policy, processes and their level of integration and collaboration on cross-cutting and multi-scaled adaptation planning.
3. **Organisational and institutional barriers:** within the structures, processes and behaviours of society and organisations that limit the agility and viability of adaptation plans and implementation success.
4. **Resource barriers:** that relate to implementing adaptation due to the development or deployment of financial, technological, human or informational resources.
5. **Psychological and social barriers:** associated with cognitive ability, denial, cultural and behaviour norms of individuals and collective organisations that limit awareness or willingness to act on adaptation measures.

There is good existing knowledge on framing adaptation problems and planning actions to address these, however, the availability of implementation knowledge remains low globally which is reflective of a broader implementation deficit[19,21]. A part of this issue has been difficulty in aligning adaptation methodologies to common policy and planning processes, which has led the United Nations Intergovernmental Panel on Climate Change (IPCC) towards the recently adopted risk-based framing for understanding adaptation impacts. This new framing is important because it enables the process of adaptation to be more easily integrated within widely understood and utilised risk management standards and practice, and therefore increases the likelihood of adaptation implementation[40,47,48].

Figure 1 summarises the identified three iterative adaptation steps. It highlights that each step has a number of components that have to be understood and accepted by stakeholders in order for progress to be endorsed and/or effective. While implementation is more directly related to practice (step three), it is now widely documented that implementation related barriers that emerge over time are often due to poor problem framing and planning[3,13,47]. Therefore, it is important to understand that implementing adaptation action is not solely an issue of practice, rather a complex interaction between how we frame the problem in specific places (Place-based framing)[11,15,17,41] and how we utilise the strengths that exist in places (key determinants for action)[1,22,35,43] to promote ownership and progressive action.

2.3 What does implementing adaptation involve?

As a standardised process, implementing adaptation actions typically involves three iterative steps that focus on problem, planning and practice. The purpose of these three steps can be broadly defined as:

i. **Problem:** Establishing an agreed understanding of the climate and related risks facing a specific place and framing how these needs to be addressed.

ii. **Planning:** Undertaking the assessment and strategic planning needed to scope and prepare agreed adaptation actions.

iii. **Practice:** Implementing agreed adaptation actions that are monitored to ensure they address identified climate and related risks (i.e. the problem).

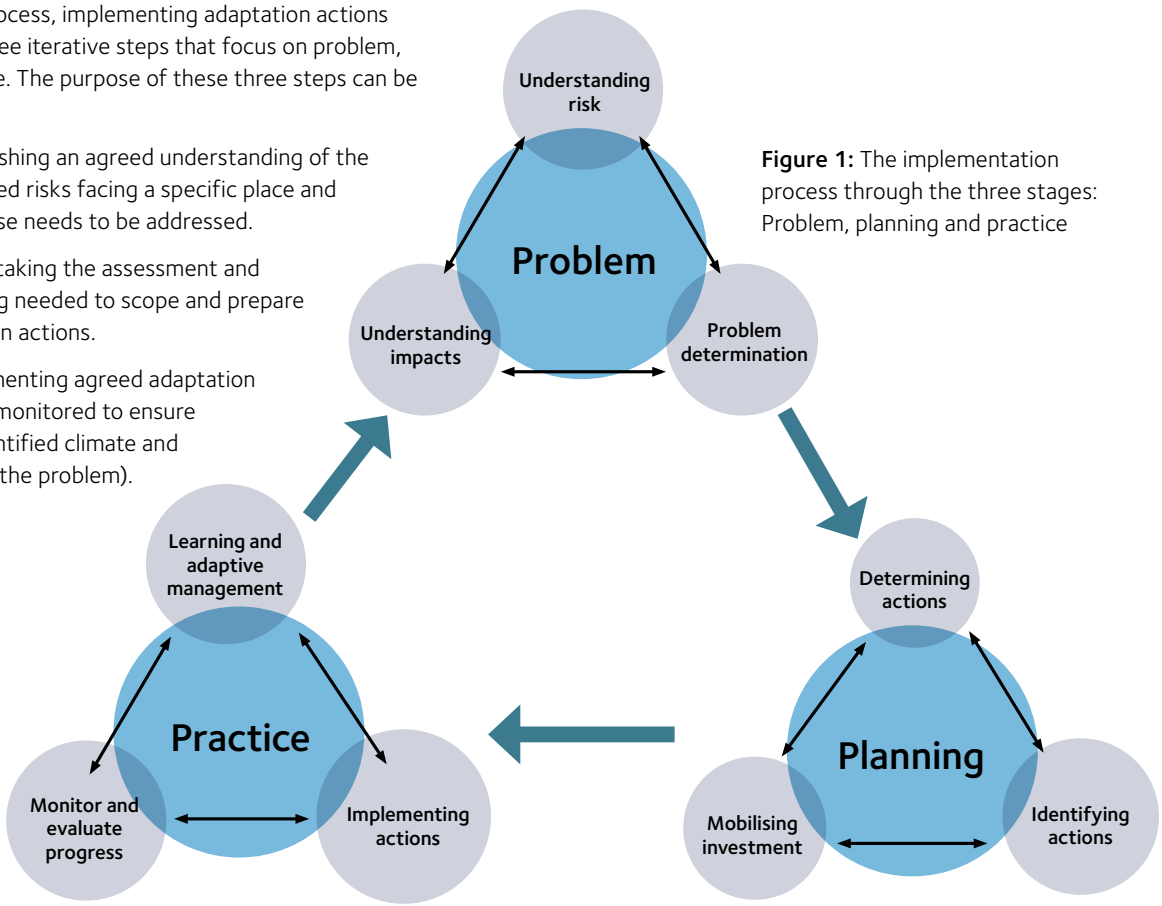

Figure 1: The implementation process through the three stages: Problem, planning and practice

Table 2: A breakdown of the components and key considerations in the three stages of the adaptation implementation process.

Step	Component	Key consideration
1. Problem	**Understanding risks**	• Engaging with stakeholders during the initial climate and related risks identification process will: – build ownership of the problem; and – provide practical insights into how climate and related risks are perceived within communities. • Supporting communities to determine their own climate risk profile will ensure more localised challenges are identified and addressed earlier. • Promoting a collaborative process will ensure a diversity of views are encountered.
	Understanding impacts	• Using an appropriate scale to determine the potential impacts presented by climate risks i.e. it has to be locally relevant. • Make sure the potential impacts of climate or related risks (and need for action) are co-drafted and endorsed by community stakeholders. • It is critical that the problem/need for action is fit-for-purpose locally.
	Problem determination	• Collaborative framing will mean that climate and related risks can be understood in the context of local issues and needs. • A balance between economic, social and environmental framing often needs to be facilitated so all voices are heard. • Allow stakeholders to communicate their framing concerns and preferred approach; • Explore any trade-offs or synergies between how climate risks are framed.
2. Planning	**Determining actions**	• Collaborative process of identifying options for addressing the identified problem(s). • Scoping and prioritising actions within the context of the agreed problem framing e.g. Resilient communities. • Ensure actions are widely agreed and endorsed.
	Identifying actors	• Collective identification and agreement on roles, responsibilities and liabilities for every action. • Where possible seek localised leadership. • Identify any capacity requirements for implementing actions. • Priorities ownership of actions by facilitating close engagement with stakeholder throughout the planning process.
	Mobilising investment	• Assess what resources are required in place (human, financial, informational, technological). • Determine if additional funding mechanisms and investors may be required. • Mobilise resources by: – ensuring locally relevant business cases for all action plans; – developing operational plans for all activities; – recruitment of experts for information interpretation or activity management; – considering the range of financing option available for climate and related risk activities.
3. Practice	**Implementing actions**	• Ensure that the implementation process is inclusive of and guided by community and local stakeholders. • Ensure the implementation process itself enables and supports capacity building. • Ensure a balance between meeting project metrics and facilitating meaningful change.
	Monitor and evaluate progress	• Capture information and data on implementation progress, including general stakeholder perspectives on the activities. • Enable stakeholders to review, consider and provide feedback on implementation progress. • Ensure a collaborative process where research has the opportunity to learn from implementation practice.
	Learning and adaptive management	• Create a culture of adaptive management that is responsive to stakeholder views and feedback. • Where necessary, work with stakeholders to review and change implementation parameters. • Co-author progress reports with stakeholders and include a diversity of views on how implementation is progressing.

3. Understanding generic barriers

Detail on each of the categories of generic adaptation barriers are provided within this section.

3.1 Informational barriers

Informational barriers are those that develop from issues associated with the lack of, creation, sharing or appropriate use of data, information and knowledge for adaptation[44,49,50]. The challenge is that these elements are required for all three steps of the adaptation process and often requires a close collaboration between policy, research and practice. In addition, data, information and knowledge for adaptation also needs to be usable and able to support decision making processes[29,30,57]. Therefore, there are often a myriad of different and competing requirements for adaptation information among stakeholders, which is often a cause of tension during adaptation planning and practice.

List of commonly cited informational barriers

i. Uncertainty about scenarios, impacts and risk outcomes
ii. Lack of data at state, regional and local levels
iii. Lack of adaptation knowledge, principles and monitoring for success
iv. Lack of regional assessments
v. Reliance on historical data
vi. Issues with information generation, interpretation and sharing
vii. Disconnect between information generation (research) and requirements for use (policy and practice)
viii. Lack of information standards for adaptation
ix. Barriers associated with using extreme events as pacemakers for change, creating adaptation measures that fail to adequately enhance adaptive capacity and efficacy
x. Difficulties in identifying goals and objectives to measure 'success'
xi. Difficulties associated with determining the appropriate technology for monitoring.

3.2 Governance and policy barriers

Governance and policy barriers are those that inhibit the process of developing and implementing adaptation governance and policy processes[2,24]. The cross-cutting and multi-scaled nature of climate change means that these need to be both integrative (i.e. horizontally and vertically integrated) and collaborative, which traditionally they are not, meaning that there is no real blue-print for guiding them[1,3,41,40]. Therefore, it is becoming increasingly clear that the utilisation of traditional governance and policy processes is not fit-for purpose to deal with adaptation and more novel approaches are required[28]. In doing so consideration needs to be given to issues of collective risk ownership, collaborative governance and innovative mechanisms for policy innovation. In the absence of integrative and collaborative approaches to adaptation governance and policy, disconnected and non-representative adaptation will occur[4,27].

List of commonly cited governance and policy barriers

i. Lack of clarity surrounding roles and responsibilities for each level of governance
ii. Lack of clarity surrounding roles public/private sector policy, regulation and control
iii. Lack of governing leadership
iv. Competing demands across governance portfolios/ sectors
v. Mismatch between adaptation timelines and political terms (short policy cycles)
vi. Historical decisions, inflexible processes and decision-making structures resulting in path dependency (and/or maladaptation)
vii. Issues with regulation and standards across jurisdictions
viii. Issues associated with policy priorities and trade-offs
ix. Lack of clarity around liabilities at varying scales
x. Legislative boundaries
xi. Lack of focus on adaptation alongside mitigation, with differentiated approaches
xii. Focus on disaster recovery rather than prevention
xiii. Inequality embedded in policies
xiv. Dependant on permissive regulatory frameworks.

3.3 Institutional and organisational barriers

Institutional and organisational barriers make up the bulk of cited barriers to implementing adaptation; this is mainly due these entities creating the common structures, processes and behaviours within which majority of our society operates[18,21,29]. Institutional and organisational barriers are often a reflection of the complex legal and financial obligations by which entities are bound and at times regulated, meaning the ability of institutions and organisations to be agile in addressing complex and cross-cutting issues like climate change can be limited[33,36,41,49,52,55]. Examples of these obligations include institutional and organisational requirements under corporations' acts that dictate corporate actions and behaviour, statutes that establish and guide government corporations as well as industry specific standards and guidelines. As such, the capacity and rate of change in institutions and organisations is often slow and a complex process of integrating additional responsibilities within an already large suite of usually competing obligations[49]. Further complicating this are tensions between climate change uncertainties and the need for evidence-based decision making, confusion surrounding climate risk ownership and response obligations, and the need to meet short-term targets at the expense of managing long-term climate change risks[53].

List of commonly cited institutional and organisational barriers

i. Lack of clear roles and responsibilities for actors (in varying contexts)
ii. Inadequate leadership or political willingness to prioritise action
iii. Difficulties associated with altering long standing rights for land owners, resource allocations, etc.
iv. Influence, control and leadership over selecting appropriate responses to challenges identified
v. Difficulties associated with managing and planning for novel scenarios
vi. Uncertainty about moving from planning to action and the depth at which change is needed within organisational and institutional processes (transformational factors)
vii. Constrained by the rate of change; institutions and organisations can limit the rate at which effective change can be implemented
viii. Conflicts of interests; difficulties in getting all involves actors to move in unison or agreement; often results in stalling, reassessment or a shift in priorities (dependant on power, politics, values and opinions)
ix. Willingness of relevant parties to use information, data and technologies available to them

3.4 Resource barriers

Resources barriers to implementing climate change adaptation relate to the development and deployment of financial, technological, information or human resources[3,53]. Given the novel nature of many climate risks and required adaptation actions, our understanding of resource requirements for adaptation is not always clear, which can present concerns over inadequate or ineffective resourcing and therefore barriers to investment. The extent to which new or existing resources should be utilised for adaptation is also often an ongoing point of contention and subsequently a further barrier in the uptake of adaptation actions. The logic utilised for resourcing adaptation can also be a major barrier to effective action. Resourcing decisions are typically subject to micro-economic logic such as cost-benefit and return-on-investment which require quantitative information on current and future costs and benefits including avoided climate damage. However, information on future benefits is problematic and difficult to quantify compared to the adaptation costs incurred today[18,29]. In addition, sectors and communities most at risk of climate change and related impacts can be highly vulnerable, lacking adaptive capacity, and therefore need the greatest support but have the least means, highlighting that societal values as well as economic logic come into play when justifying resource investments for climate change adaptation.

List of commonly cited resource barriers

i. Lack of expertise at all scales (Human resources)
ii. Inefficient use of available resources
iii. Lack of funding or self-funding mechanisms at varying scales for adaptation (financial resources)
iv. Difficulties associated with justifying high costs for hard adaptation solutions (economic resources)
v. Lack of appropriately targeted funding for adaptation (financial resources)
vi. Low returns on investments for adaptation (economic resources)

3.5 Psychological and social barriers

Psychological and social barriers to implementing adaptation are incredibly complex because they are reflective of how people think and broader community culture[20,21,25]. For instance, there are diverse perspectives on climate change science, difficulties in understanding and accepting climate change risks and differing opinions on the best course of action, all of which are representative of psychological and social influences. These can be due to a range of factors such as cognitive ability, ideological views, cultural and behavioural norms, vested interests, lack of social participation or fear of change. Where psychological and social barriers are not adequately understood and addressed, further challenges can emerge with people and communities becoming disengaged, resistant to change and unwilling to act. Therefore, although psychological and social barriers are not immediately apparent or tangible, they can be a decisive factor in the formation of other barriers and can limit successful implementation of adaptation actions. Social and cultural barriers to implementing adaptation are explored in greater depth in an accompanying policy brief†.

List of commonly cited psychological and social barriers

i. Public uncertainty, limited understanding and personal ideologies about the cause and effects of climate change
ii. Public mistrust in climate change experts, politicians and government groups
iii. Failure to demonstrate tangible benefits to community/ business/organisations
iv. Lack of community cohesion; individual benefits emphasised
v. Lack of public understanding about the adaptation development process
vi. Politicised nature of climate change policy
vii. Issue fatigue and apathy
viii. Denial and fear reinforcing uncertainty

4. Moving beyond generic adaptation barriers

4.1 Framing considerations

Framing is how we interpret problems, trends or occurrences, and is often influenced by our underpinning values, theories or interests. Good framing helps ensure planning, investment and responses target root causes rather than symptoms or interests. The link between good framing and successful action is widely recognised. Complex problems like climate change adaptation are difficult to frame because they cut across all aspects of our economic, social and environmental systems[7,10]. This presents a major barrier to the effective implementation of adaptation plans, because we are still trying to come to grips with climate change, it's related risks and their potential impacts.

Figure 2 provides a brief overview of the three common types of framing required for scoping climate change adaptation, depending on the scale and application of adaptation being sought. In general, it suggests that:

- **Science-based framing** is good for knowledge-based activities which at this stage tend to be global rather than locally focused adaptation based on action.
- **Policy-based framing** is critical for bridging the gap between science and practice. It takes a balanced view between both global-local and knowledge-action tensions.
- **Practice-based framing** is much more local, and action focused, therefore key to implementation.
  - Science on climate change is difficult to construct at the local level and therefore comes with elements of uncertainty **(Limitation 1)**.
  - Practice is often context specific and locally focused, so global standards on adaptation practice are usually only principle based **(Limitation 2)**.

In terms of barriers to the implementation of adaptation, each framing approach has strengths and weaknesses, so selecting the right framing is critical because it:

- locks in the scale of the problem being considered and the type of application being sought.
- influences the type of stakeholders, skills and expertise required.
- will ultimately be a key factor in down-stream success or failure.

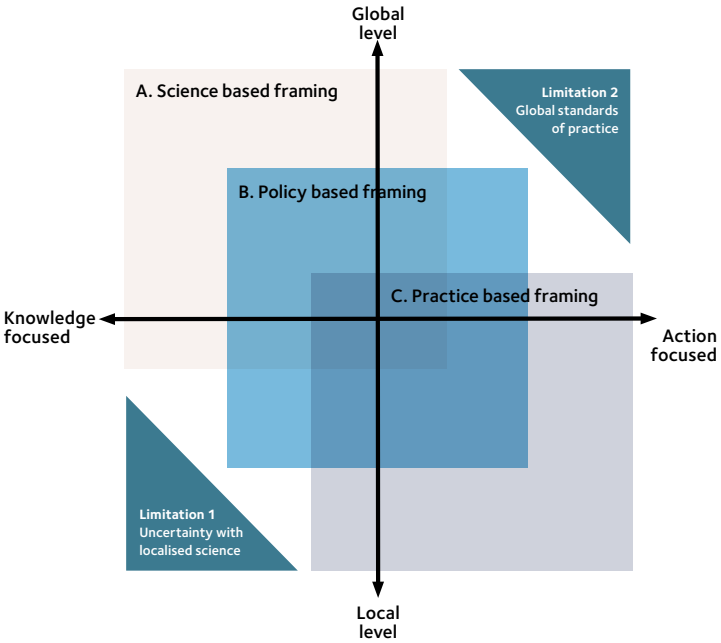

Figure 2: Overview of common adaptation framing types based on scale (Y axis) and application (X axis).

† Foxwell-Norton, K & Walters, K., 2019, *Social and cultural barriers to the implementation of climate change adaptations plans and action.* Griffith University, Brisbane.

4.2 Tension considerations

Regardless of the framing chosen for climate change problems, there will always be considerable tensions among stakeholder views toward climate change and how to respond[23]. These tensions are reflective of the diversity of views climate change evokes due to the cross-cutting nature of many climate change problems[6,7]. Figure 3 provides a summary of the common tension associated with understanding and addressing climate change. Central to this are common overarching climate change tensions that often create a fractious base from which climate change problems can be collaboratively considered and addressed[31,56]. These common overarching tensions are identified as:

- **System tensions:** The tension between how we value our economic, social and environmental systems.
- **Acceptance tensions:** The tension between how people accept the probability of climate change in contrast to the marginal uncertainty around the climate change science.
- **Ownership tensions:** The tension between responsibility for causing climate change compared to accountability to act.
- **Response tensions:** The tension between the costs and benefits of climate change adaptation options.

In addition, there are also scale (global-local) or application (knowledge-action) based tensions that can further exacerbate collective action on climate change. Like with framing, the way we understand, address and manage these tensions is a critical determinant to the down-stream success of climate change adaptation actions[6,23].

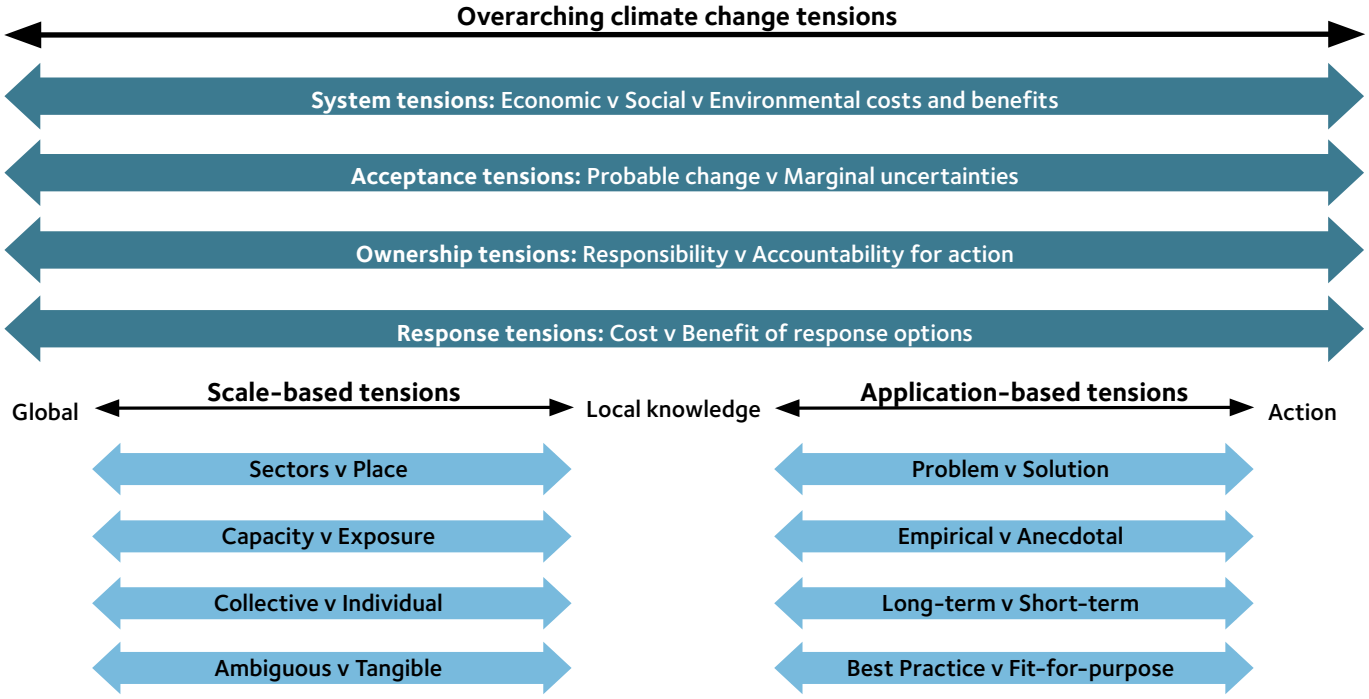

Figure 3: Common tensions associated with understanding climate change and implementing adaptation.

4.3 Place considerations

Location, history, culture, industry, population and weather as just some of the myriad of factors that come together to create a place[7]. With so many variables contributing to the characteristics that make a place, it is clear that no one place is the same; likewise, every place has its own set of unique challenges and opportunities[31]. In terms of complex local and regional challenges, place-based thinking is logical because it ensures both equity among stakeholders and connectivity among systems are addressed across the entire place. This makes place-based thinking a useful way of ensuring that regional or local level responses to complex climate change problems meet the unique adaptation needs of the entire place. The two main benefits of place-based thinking for climate change adaptation implementation are:

- **Local buy-in:** Local communities have the power to determine their own future in the context of their own unique characteristics, which is more likely to generate greater ownership and lasting action.
- **Integrative action:** Important connections between local and regional systems (economic, social and environmental) are more likely to be identified and addressed.

4.4 Approach considerations

While sections 4.1 – 4.3 highlight key considerations for ensuring effective climate change adaptation, it is clear from social change knowledge that the approach taken to enact change is often a key determinant for success. However, given the all-pervasive nature of climate change, defining an effective approach to adaptation is complicated given:

- the novel nature of the problems that climate change creates.
- no one party is responsible for the cause and therefore accountable for the need to act.
- our economic and social systems are not setup to deal with complex, cross-cutting issues.

Figure 4 outlines some of the key outcomes and functions that a good approach to climate change adaptation should incorporate. One of the emerging areas trying to achieve such outcomes and functions in adaptation is a partnership approach. In this approach research, policy and practice come together as co-collaborators on common adaptation problems, making it an effective way to address the complex and cross-cutting nature of climate change issues[7].

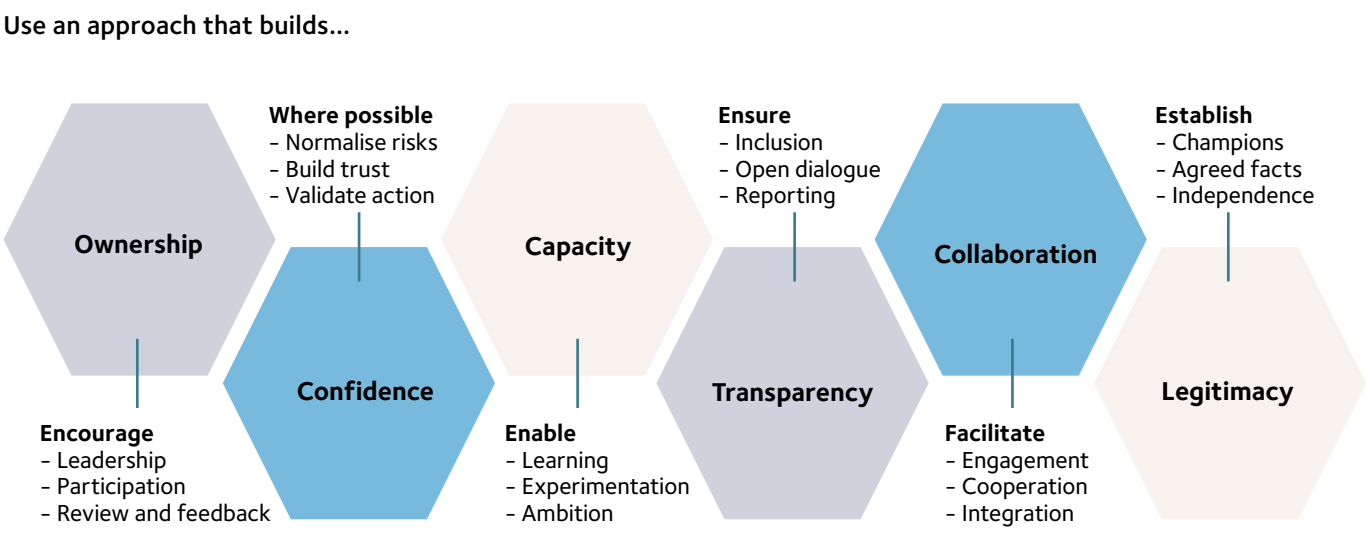

Figure 4: The key outcomes (hexagons) and functions (accompanying text) for approaching adaptation.

5. Ongoing considerations

There are three main ongoing considerations that this policy brief seeks to highlight.

Firstly, climate change adaptation actions need to be based on a combination of good science, policy and practice. Implementation of such actions however, remains primarily a practice-based activity which requires genuine engagement in the relevant local and sectoral contexts for implementation to be successful. This suggests that the process of identifying and overcoming barriers to adaptation needs to give early consideration to understanding the climate change adaptation implementation process itself and context in which it will occur.

Secondly, while there are generic barriers to implementing adaptation actions relevant for local and regional government; implementation planning needs to move beyond generic barrier considerations towards more dynamic exploration of both barriers and enablers. As Figure 5 suggests, this is a layered exercise in considering how to frame your adaptation objective, understanding the likely tensions you may encounter, understanding the unique characteristics of the place where adaptation is sought, and utilising an effective approach.

Finally, it is critical to be mindful that the objective of adaptation sits within the broader context of sustainable development. Climate change is not a stand-alone problem, it is a human-induced problem that threatens the stability of human and natural systems and therefore requires changes in how we live in order to ensure our ongoing prosperity.

Although not always clearly articulated, this way of thinking is evident by:

- One of the 17 sustainable development goals being Climate Action (SDG13); and
- The IPCC's current framing of climate action as an exercise of Climate Resilient Development Pathways.

This means that climate change adaptation is not in conflict with development and prosperity, but rather trying to ensure its continuation in a sustainable way.

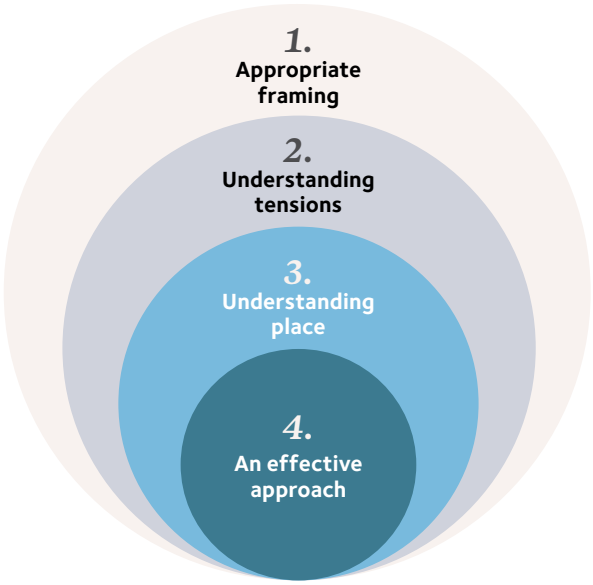

Figure 5: Nested components of effective implementation development for ongoing climate change adaptation.

6. Conclusions

Climate change adaptation is primarily a practice-based problem; however, the novel and place-based nature of many climate change problems makes it difficult to identify, scope and implement proven adaptation actions. Government has a critical role to play in establishing and facilitating the necessary conditions for all its constituents to effectively understand and adapt to climate change risks. In doing so, government policy and investment needs to move beyond a generalised view of barriers to adaptation as issues that can arise throughout a standard planning and implementation process, towards recognising barriers as a by-product of how we are actually understanding climate change problems and subsequently approach dealing with it.

In particular, government investment into adaptation needs to give careful consideration to:

- Framing adaptation investments in a way that they can be effectively dealt with by all relevant stakeholders by addressing common application and scale challenges.
- Supporting stakeholders to understand and overcome tensions associated with addressing complex climate change problems.
- Ensuring adaptation investments have consideration of the diverse economic, social and environmental conditions in a place.
- Planning and implementation approach that build adaptive capacity within relevant stakeholders.
- Positioning adaptation as part of societies more broadly established sustainability practices.

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