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Harnessing the temporal and projective attributes of human agency to promote anticipatory climate change adaptation

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Abstract

Human agency is seen as a critical component of adaptive capacity concerning environmental change. This capacity may entail social actor's ability to learn from past experience, and create opportunities in the present for dealing with uncertainty and change in the future. However, it also means that actors need to be able to overturn structural barriers that impede anticipatory adaptation to climate change such as lack of political leadership, power imbalances, acceptance of climate risks and willingness to act. While scholarship around questions of structural barriers is common in environmental studies literature, there is less understanding about how future thinking could help to strengthen human agency. Harnessing the temporal and projective attributes of human agency by which social actors can exert influence over the future and create solutions may comprise a promising way forward. This paper investigates how social actors understand past social and environmental change and explores how scenario planning may help actors apply their understanding of changes over time to devise policies for climate change adaptation. The paper applies this exploratory lens to an Australian coastal local government area engaged in scenario planning and adaptation pathways planning. Findings indicate that the temporality aspect of agency applied to solving complex issues and overcoming structural barriers manifests differently from an individual to a collective perspective. This means that while scenario planning and adaptation pathways planning helps with anticipatory identification and experimentation, this may not be sufficient to overturn structural barriers to adaptation in the short-term.

KEYWORDS
adaptive capacity, coastal, local government, scenario planning, strategic planning

1 | INTRODUCTION

There is high confidence that human-induced climate change is accelerating the occurrence and intensity of extreme events leading to widespread losses and impacts on human and natural systems (IPCC, 2022). Exemplars of this include the unprecedented 2015-2016 Tasman Sea marine heatwave (Oliver et al., 2017), the concurrent extreme heat wave events across America, Europe and Asia in 2018

(Vogel et al., 2019), and the catastrophic 2019–2020 Australian bushfires (van Oldenborgh et al., 2021). There is, therefore, urgency in proactively responding to climate change and adapting to unavoidable impacts with calls for both collective and individual agency to steer structures and systems towards transformational adaptation (O'Brien, 2015).

This interpretation, and expectation, of agency demands not only grass-root activism but also political leadership. It points to Westley et al.'s (2013) discussions around the junction between agency and the concept of transformation, especially to deal with complex problems such as climate change. In this context, transformation entails people's capacity to create a new system when the ecological, political, social or economic conditions are not conducive to maintaining the existing one (Walker et al., 2004). Transformational adaptation may also demand significant policy shifts to enable the implementation of more complex adaptation options such as retreat from at risk areas (New et al., 2022).

Achieving transformational adaptation, especially structural and systemic transformation, however, is a challenging task (Fedele et al., 2020). For example, there are many known barriers to climate change adaptation, including those related to social actors' understanding of barriers, and the extent to which both governance processes and the context in which adaptation takes place enable or hinder adaptation (Biesbroek et al., 2013). Those barriers can affect people's capacity to revert untenable ecological, political, social or economic conditions, leading to system collapse as opposed to enabling the transformation of complex adaptive systems (Westley et al., 2013). Hence, for transformation to occur there is a need to better understand how barriers to adaptation can be overcome, especially those related to adaptation governance (Biesbroek et al., 2014).

This is perhaps behind the reasons as to why we find ourselves in a (new) era where calls for climate emergencies are proliferating on a number of fields and jurisdictions (Hammonds, 2020; Hulme, 2020; Wilkinson & Clement, 2021) based on the evidence of accelerated climate change impacts worldwide (Babcock et al., 2019; Herring et al., 2018; IPCC, 2019). Yet, concrete action remains elusive in most countries around the world (Hammonds, 2020) and are reflected in the shy outcomes from the latest COP26 (Hales & Mackey, 2021).

This context reinforces Westley et al.'s (2013) call for further studies to improve our understanding of how agency can contribute to deliver much needed action on how we respond to climate change impacts. This paper contributes to agency literature by first investigating one of the known barriers to human agency (Dietz & Burns, 1992; Giddens, 1984)—in our case, actors' understanding of the past, present and future changes affecting their area. It then draws on the projectivity, especially the temporality dimension of agency (cf. Emirbayer & Mische, 1998) to explore how scenario planning may help actors apply their understanding of changes over time to devise policies for climate change adaptation. The use of scenario planning to aid climate change adaptation has increased in the past decades as it helps people to envision a range of plausible futures and facilitates collaboration and collective action (Begum et al., 2022). Scenario planning can be broadly classified into three types depending on how thinking about the future is considered. These include predictive, exploratory and normative scenarios (Börjeson et al., 2006). The first type investigates what will happen in the future, the second establishes what can happen and the third identifies what needs to be done to achieve specific targets. Notably, exploratory and normative scenarios (especially backcasting) have become increasingly popular over the last decades because they are well-placed to facilitate stakeholder engagement and collaboration (Kok et al., 2011).

The paper is based on action research (Reason & Bradbury, 2006) that involved practitioners, elected and community members from the Shoalhaven Region (New South Wales, Australia). The 4-year research project, titled 'Managing environmental change through planning for transformative pathways', used exploratory scenario planning (cf. Börjeson et al., 2006) to design collaborative adaptation pathways for the region to address climate change impacts. The paper is structured as follows: it first outlines the analytical approach and findings. The discussion explores how agency is present and what influences its development, especially to enable anticipatory adaptation to climate change. The paper concludes with ongoing challenges related to this and identified areas for future research.

2 | BACKGROUND AND ANALYTICAL FRAMEWORK

2.1 | Background: The evolution of the agency concept in the environmental change context

The term agency has been widely discussed across a range of social science fields, including sociology, politics, social psychology and economics (Matarrita-Cascante et al., 2017). One of the key questions that has dominated the discussions around agency is how the social-political context, also referred to in the literature as structure, influences people's capacity to act in a particular way, or their agency. While some scholars argued that human behaviour is governed by social structures (e.g., ideologies, norms and moral codes), others argue that humans are 'free agents' whose behaviour and actions are a product of rational and intentional interpretation of their world (Emirbayer & Mische, 1998). Agency is not uniform (Davidson, 2010); it varies across differing societal groups, individual experiences and along the temporal scale of their lives (Hitlin & Kirkpatrick Johnson, 2015). It includes both the capacity of an individual and/or the community to drive or influence change. Davidson (2010) states that from an individual perspective agency comprises confident and autonomous people capable of enacting change; whereas agency from a collective perspective encompasses cultural, infrastructural and communication resources that are conducive to collective action. Additionally, Dietz and Burns (1992) stress the non-linearity of actions because of actors' differing agency intensities at different points in time, or that actions are effective, intentional, unconstrained and reflexive. The first criterion set by Dietz and Burns relates to the

extent to which actors have power to influence others' culture or behaviours (efficacy). The second refers to the need for actions to have clear intentions as to what it is aimed to be achieved (intentionality). The third acknowledges that actions have a degree of imbedded creativity and spontaneity that enables choice and decision-making (unconstraint). Lastly, actors are able to reflect on actions and monitor their impacts on others (reflection).

Emirbayer and Mische (1998) emphasised that the concept of human agency has a past, present and future temporal dimension related to social engagement processes, in which present human actions are not only guided by past habits but also projected into future situations. They identify three dimensions of agency—iteration, projectivity and practical evaluation. The authors also acknowledge that social actors act in structural contexts with similar dynamic temporalities, which affect their agency, making them switch from present to past and future in multiple combinations to respond to contextual changes in less so deterministic (structuralist) and free will (intentionalism) ways. Notably, their work points to how agency has a projective dimension by which social actors can exert influence over the future and create solutions. For this, Emirbayer and Mische highlighted how social actors' creative and imaginative engagement of the future is critical to problem solving. The latter guarantees that empirical social action will never be completely determined or structured. In the same way that changes influence individual life courses, human agency can also influence future pathways through projection because of the intertwined relationship between life and time (Elder, 1994).

2.2 | Analytical framework

This study applies a framework based on Dietz and Burns (1992) and Emirbayer and Mische's (1998) works on human agency to: (i) investigate actors' understanding of the past, present and future changes affecting their area; and, (ii) explore how scenario planning may help actors apply their understanding of changes over time to devise policies for climate change adaptation (see Figure 1). Dietz and Burns (1992) identified three barriers that affect social actor's agency, namely: the misunderstanding of the physical world, especially due to the mismatch in temporal scale between human actions and natural processes; how rules are enacted, interpreted and followed by cultures—or the relationship between agency and structure; and, the unbalanced power held by different actors. This study focuses on the first of the three barriers to address its first aim (i.e., investigation of actors' understanding of the past, present and future changes affecting their area) given the role knowledge plays in determining human agency (Giddens, 1984).

While Dietz and Burns' work was not directly related to climate change impacts, it offers a suitable lens because most of the environmental changes we are currently seeing are a result of past anthropogenic actions that did not take into account their long-term effects on the natural system. As we confirm our impact on the natural system, the need for action to avoid catastrophic consequences becomes more urgent (IPCC, 2021). In this regard, the four criteria Dietz and Burns attributed to agency are also relevant. In particular, the authors stressed the non-linearity aspect of human actions because of actors

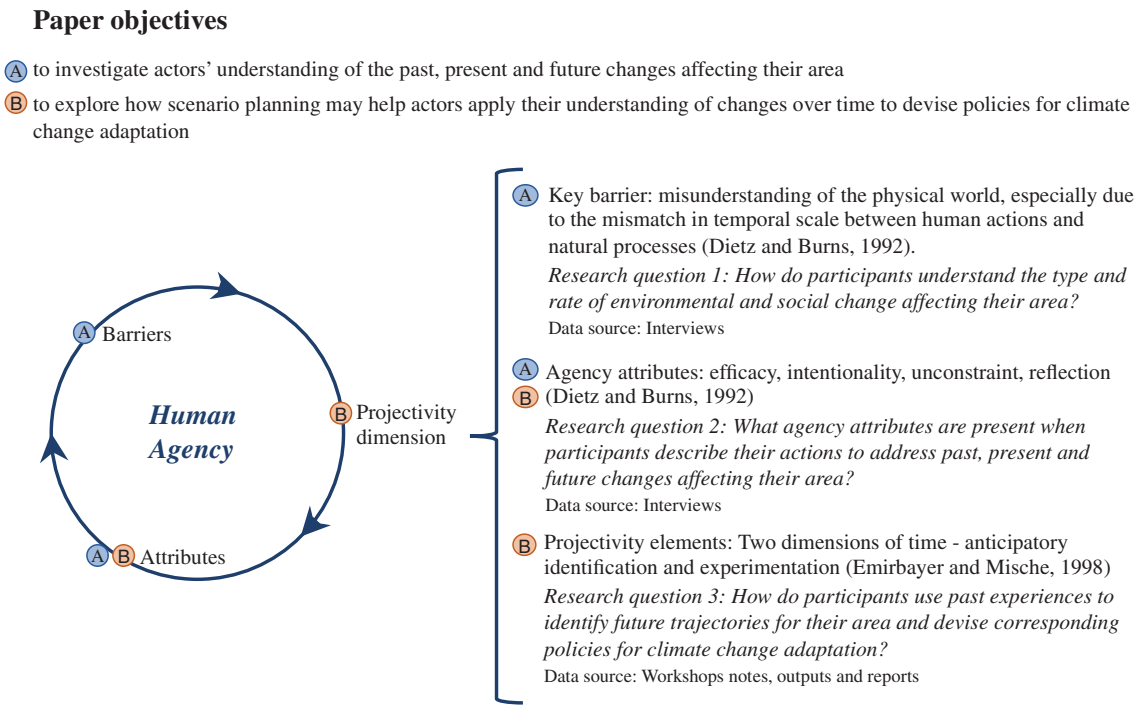

FIGURE 1 Analytical framework guiding the investigation of human agency for climate change adaptation [Color figure can be viewed at wileyonlinelibrary.com]

differing agency intensities at different points in time, or that actions are effective, intentional, unconstrained and reflexive. The first criterion set by Dietz and Burns relates to the extent to which actors have power to influence others' culture or behaviours (efficacy). This criterion is particularly important as it can help overcome some of the known barriers to adaptation at the agency-structure interface such as governance and context related barriers (Biesbroek et al., 2013). The second refers to the need for actions to have clear intentions as to what it is aimed to be achieved (intentionality). This criterion has an important role in the way actors use their knowledge to devise adaptation policies, especially when those are developed at present to maximise their effectiveness in the future. The third acknowledges that actions have a degree of imbedded creativity and spontaneity that enables choice and decision-making (unconstraint). This criterion is closely aligned with the projectivity element of agency discussed by Emirbayer and Mische (1998), which entails a degree of imagination to devise actions. The criterion also helps capture actors' ability to identify multiple plausible futures under which to stress test potential adaptation policies. Lastly, actors are able to reflect on actions and monitor their impacts on others (reflection). This criterion is useful to identify personal reflections about actions to not only illustrate their efficacy but also how actions in hindsight should have been done or framed differently.

Emirbayer and Mische (1998) argued that human agency has three constitutive elements, namely: iteration, projectivity and practical evaluation. Our analysis is mostly interested in the projectivity element, which the authors defined as: … the imaginative generation by actors of possible future trajectories of action, in which received structures of thought and action may be creatively reconfigured in relation to actors' hopes, fears, and desires for the future'. (p. 971). The authors identify three internal elements to projectivity (i.e., narrative construction, symbolic recomposition and hypothetical resolution) and two dimensions of time in which actors anchor their actions (i.e., anticipatory identification and experimentation). To address the second aim proposed for this paper (i.e., explore how scenario planning may help actors to apply their understanding of changes over time to devise policies for climate change adaptation), we focus our attention on the two elements concerned with the dimensions of time. These include anticipatory identification, which concerns the relationship between past experiences and how those inform future trajectories, including the construction of narratives involving future possibilities; and, experimentation, which refers to how the relationship between past experiences and future trajectories is enacted at the present to respond to emerging situations. Together with the unconstraint criterion proposed by Dietz and Burns (1992), Emirbayer and Mische's (1998) two dimensions of time are well placed to capture the future thinking aspect imbedded in the exploratory scenario planning (Börjeson et al., 2006) and the adaptation pathways planning process (Walker et al., 2013) participants carried out during the course of this study (see section 3 for details). In particular, exploratory scenario planning enables actors to identify and discuss events or situations that may unfold in different ways in the future—that is, it enables the generation of multiple plausible futures against which policies can be tested to evaluate their effectiveness in achieving intended outcomes as well as necessary adjustment to accomplish this (anticipatory identification). Actors can then use this assessment to scope trajectories for action through the adaptation pathways planning process (experimentation).

3 | RESEARCH APPROACH AND METHODS

3.1 | Context of the case study

Davidson (2010) argues that when agency is present so is the ability to respond to crises, including crises related to environmental and social changes. This paper focuses on the Shoalhaven local government area, New South Wales (NSW), Australia. Like many other coastal areas worldwide, in addition to coastal hazards, the Shoalhaven has been affected by multiple severe weather events over the last few years, including drought, bushfires and floods (Palazzo et al., 2020). The combination of multiple climate-related risks occurring at the same time, or within shorter time scales than previously, coastal location and changes in population and urbanisation rates comprise key challenges for this local government and residents to respond to and plan for; thereby making it a suitable case for investigating actors' agency related to environmental and social changes.

The Shoalhaven local government area is situated on the NSW south coast and covers an area of 4531 square kilometres comprising large areas of national parks, state forest, bushland, beaches and lakes. The region has a population of 107,191 residents distributed across 49 towns and villages, with most of the population inhabiting the coastal fringe (id. Consulting, 2021a). The region has a long indigenous history and the first settlers' townships were established in 1822 as service centres to support the surrounding farming areas (Bayley, 1975). Significant population growth started in the 1970s and 1980s, especially as the region became a popular retirement and holiday destination. Shoalhaven's natural amenity and lifestyle continues to draw large numbers of new residents to the area each year, making it one of the fastest growing local government areas in NSW. By 2051, the Shoalhaven's population is expected to increase by almost 30% (id. Consulting, 2021b). The region has a significantly higher than average proportion of ageing population due to an ongoing in-migration of retirees seeking a coastal lifestyle ('Sea Changers') and out-migration of youth (id. Consulting, 2021b). This trend is expected to continue and the largest population increase between 2016 and 2031 is projected to be in people aged 75–79 (id. Consulting, 2021b).

The region's diverse natural environment and its close proximity to Sydney and Canberra, makes it the second most visited tourist destination in NSW (Shoalhaven City Council, 2018a). Many towns are popular holiday destinations and a large proportion of their housing stock are holiday and/or second homes (Australia Bureau of Statistics, 2016). Hence, the region has a large proportion of absentee home owners who visit it during weekends and holiday periods or lease their properties for tourists throughout the year.

TABLE 1 Participants involved in the project activities and methods for data analysis

Project activity	Number of participants per group*				Data type and analysis
	Practitioners	Elected members	Community members	Total	
Workshop 1: Initial scoping (June 2018)	5	2	14	21	Workshop notes, outputs and reports content analysed to explore how a focus on planning for multiple futures may help participants to further develop their agency to advance climate change adaptation
Workshop 2: Visioning and developing scenario narratives (September 2018)	2	2	9	13	
Workshop 3: Identifying future policies/options (November 2018)	2	2	12	16	
Workshop 4: Testing policies/options against scenarios (March 2019)	3	3	5	11	
Workshop 5: Backcasting (August 2019)	2	2	8	12	
Workshop 6: Adaptation pathway planning (December 2019)	1	2	6	9	
Interviews	4	3	9	16	Interview transcripts coded and thematically analysed to investigate interviewees' understanding of the past, present and future changes affecting their area

[a]Not all workshop participants were the same persons.

The 49 towns and villages that comprise the Shoalhaven are socially and economically diverse. Socio-economic characteristics such as income, educational attainment, unemployment levels, housing expenditure, assets, and vocational skills vary significantly amongst towns and villages. Data from the Australia Bureau of Statistics (2016) show a significant variability in the level of disadvantage recorded across the different towns and villages in the Shoalhaven. For example, whilst nine towns and villages in the Shoalhaven were amongst the least disadvantaged locations in Australia, other locations were listed amongst the most disadvantaged areas of NSW (id. Consulting, 2021a).

The diversity of the Shoalhaven community is also reflected in local politics. The Shoalhaven is divided into three wards, which are represented by 12 Councillors and a Mayor, four Councillors representing each of the wards. At the time of this research, the political affiliation of these representatives varied significantly, with four of the Councillors (including the Mayor) affiliated with The Greens party, four Independents, four Shoalhaven Independents, and one Country Labour. The relationship between the Councillors has regularly been characterised as 'disrespectful' by research participants and has been the source of much frustration, with many blaming the lack of action on environmental issues on the diverse political affiliation and personal agendas of some Councillors. The working tensions between the Councillors have reached such a high level by mid-2020 that a local NSW cabinet member has called for an urgent election ahead of time; calling the Shoalhaven City Council 'toxic' and 'dysfunctional' (Fuller, 2020).

3.2 | Methods

This paper adopted a qualitative case study approach (Yin, 2003) focused on a 4-year (2017–2021) collaborative, action research project (Reason & Bradbury, 2006), titled 'Managing environmental change through planning for transformative pathways'. The project used exploratory scenario planning to design collaborative adaptation pathways for the Shoalhaven region to address climate change impacts. Six full-day workshops were carried out for developing scenarios (Börjeson et al., 2006; Serrao-Neumann et al., 2019) and adaptation pathways planning (Walker et al., 2013; see Table 1 for details). The project involved the participation of council personnel (practitioners), elected members and community members composing two strategic committees set up by the Shoalhaven City Council; the Natural Resource and Floodplain Management Committee and the Sustainable Futures Committee established in 2016 and 2017, respectively. The primary role of these committees was to provide policy-advice and support decision-making regarding natural resource management and sustainability. Each committee included a number of community members who were purposefully selected based on their knowledge about and/or expertise in natural resource management and/or sustainability. Council disbanded both committees in September 2018. The decision was challenged at an Extra Ordinary Meeting, but was overruled by 7 out of the 13 Councillors (Shoalhaven City Council, 2018b). Despite this, a number of community members continued to participate in the project as general citizens.

Empirical data informing this paper are primarily from two sources: workshop notes, outputs and reports, and semi-structured interviews with 16 individuals purposely selected (Zhang & Wildemuth, 2009) from the pool of participants in the scenario planning and adaptation pathways workshops (see Table 1).

Workshops were carried out between June 2018 and December 2019. The exploratory scenario planning process was based on the method described by Serrao-Neumann et al. (2019) and involved tasks completed by workshop participants and the research team. Based on their method, participants developed the following vision statement to guide their scenario and adaptation pathway planning process:

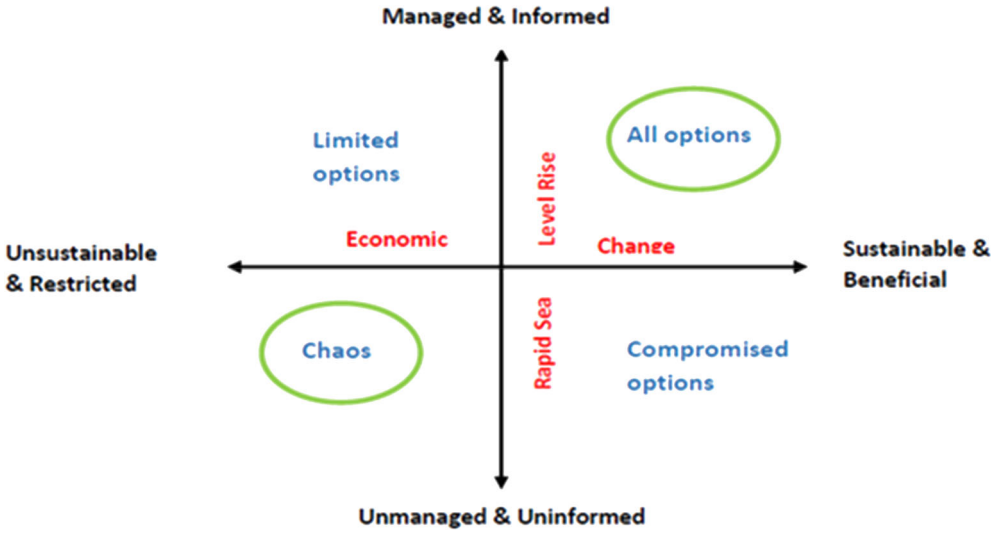

FIGURE 2 Axes showing four plausible scenarios identified by project participants and the two selected scenarios (circled) for testing future strategies/options [Color figure can be viewed at wileyonlinelibrary.com]

> Everything that we do in the Shoalhaven will create a community that understands the challenges of change and adapt innovatively. It will be an inclusive community that respects, protects and restores the natural heritage and ecosystems that support biodiversity for the wellbeing and enjoyment of future generations. It will be a community that pursues sustainable economic opportunities for all and welcomes cultural and social diversity.

The following focal question was used to guide the identification of drivers of change affecting their communities, considering global, national, regional and local scales and classification of these drivers of change according to their importance and uncertainty (i.e., critical drivers):

> What plausible current and future drivers of change will influence the Shoalhaven community in the next 25+ years and which need to be taken into account when developing transformative pathways to managing social and environmental change?

The two most uncertain and important drivers identified by participants included 'economic change' and 'rapid sea level rise'. The economic change axis was defined by two extreme forms of change: unsustainable and unrestricted, and sustainable and beneficial. The rapid sea level rise axis was defined as managed and informed, and unmanaged and uninformed. When combined, the two axes generate four quadrants, which defined four plausible scenarios, namely: Limited Options, All Options, Chaos and Compromised Options (see Figure 2). Participants chose two scenarios to provide the basis for the future policies/options testing: All Options and Chaos.

The adaptation pathway planning process was guided by the CoastAdapt approach (https://coastadapt.com.au/pathways-approach). Building on the policies testing against the two scenarios (i.e., wind tunnel test to establish how policies would play out under the different scenarios, and identify necessary changes or amendments to those to ensure their effectiveness), the process was set out to involve the following steps: (i) a backcasting exercise; (ii) identification and consideration of shocks and surprises leading up to the timeline of the vision statement; (iii) identification of turning, tipping and trigger points; (iv) establishment of termination points and contingency actions; (v) establishment of preferred adaptation pathways plan; and, (vi) the development of monitoring, evaluation, reporting, improvement and learning process. An additional workshop was planned to occur in early 2020 to complete the last two steps but this never occurred as bushfires severely affected the region at the end of 2019 (Palazzo et al., 2020), followed by the disruption caused by the Covid-19 pandemic in 2020–2022. At the time of writing this paper, the Shoalhaven was still in the process of recovering from the bushfires (https://getinvolved.shoalhaven.nsw.gov.au/BushfireRecoveryShoalhaven).

Interviews were carried out in March 2019, after workshops 1–4 were completed (see Table 1). It is important to note that interviews were held at the back of state government elections (March 2019) which saw the re-election of the conservative coalition government (Liberal and National parties) known to have a pro fossil fuel agenda (Lucas, 2021). Interviews aimed to collect information regarding participants' (i) understanding of the type and rate of past and future change affecting the area; (ii) capacity for future thinking; and, (iii) capacity to act to deal with changes. Interviews lasted between 40 and 90 minutes, were recorded and transcribed verbatim. Data from workshops and interviews were coded and analysed thematically (Bowen & Bowen, 2008). Interview data were analysed using NVivo software (see Tables SM1 and SM2 in the supplementary material for details about interview questions and codebook used in the analysis).

4 | RESULTS

This section is presented following the different components proposed by the analytical framework described in section 2.2 (see Figure 1). Section 4.1 reports on the knowledge barrier attributed to agency followed by agency attributes (sections 4.2 and 4.3) outlined

by Dietz and Burns (1992). Data informing these sections were drawn from interviews. The final section 4.4 reports on the projectivity dimensions of time (anticipatory identification and experimentation) proposed by Emirbayer and Mische (1998). This section is primarily informed by data from workshops.

4.1 | Sound understanding of past, present and future changes

Interviewees, regardless of their role (i.e., practitioners, politicians or community members), had a very good understanding of how past social and environmental changes affected their area, and of how these changes are likely to also impact their future. Importantly, their understanding of environmental changes relating to climatic alterations were well connected with both the global and local contexts. For example, one politician referred to documented and empirical evidence that confirmed changes in average temperatures and rainfall patterns:

> I think that there's plenty of documented evidence that they are happening. We can measure that the three hottest years have happened in the last four years. We can see that the measured temperatures are changing at rates unprecedented in human history. We can see that our rainfall has changed dramatically. (Elected member, interview # 3)

There was also evidence of their sound understanding of future changes, especially related to how climate change will impact their coastline:

> Well, the sea level rise will impact our communities living right on the coast and in our estuaries…Not so much because in 20 years the sea level will rise, but I think because of coastal inundation from storm events and erosion. (Practitioner, interview # 2)

And of how urbanisation rates will continue to impact the locality's character and environment:

> The place is just going to get bigger and it's going to re-urbanise. And tourism is going to become even bigger here and have more impact, a lot of which will be detrimental… Environmentally and sustainably, I think everything is at risk. (Community member, interview # 8)

These examples show that interviewees had a very high understanding of the threats they were facing from both environmental (e.g., climate change) and social origins (e.g., political structure). They also had a very good understanding of their limitations, or the limits of their actions, against a backdrop of system originated structures that both impeded and frustrated their actions and attempts to exert influence over decisions. Some interviewees thought that positive changes were still able to occur under the same structural constraints and pointed to successful initiatives and actions led by the community, whilst recognising the barriers for government action:

> I have been involved in developing quite a lot of plans for various things, and I find the most successful ones are the ones that definitely involve, or that are driven by the community, because they're the ones that can get things done. Governments have a lot of restrictions placed on them through legislation, through bureaucracy. Whereas communities can really get things done without those. (Practitioner, interview # 1)

In contrast, others pointed to how politicians used the structure of the system to quell bottom-up initiatives and/ or demands from the community signalling a rather bleak picture of leverage power, or perpetuating a perverse cycle enabled by existing structures:

> It's really frustrating because there is definitely the use of process to frustrate the community, it happens at all levels of government. Politicians can play a waiting game, community has to go back to work after the consultation process and then two years later they just rely on the fact that the community moved on from that issue to sort of brush it under the carpet. (Community member, interview # 2)

4.2 | Limited efficacy despite clear intentionality

Our findings did not result in significant evidence that social actors believed their actions had a positive effect on the course of decisions. When this was present, it mostly related to actions that did not depend on a great deal of support from decision-makers nor policies such as activities carried out by volunteers in their communities:

> Some communities have actually been very proactive. There're communities that are doing things like promoting and trialling beach clean-ups and so forth. We have a very active volunteer base for communities. We have a bush care program where people actually go out and do a lot of regeneration of these natural areas… (Practitioner, interview # 1)

Interviewees believed they had agency (by being selected to become members of advisory committees) and were inspired and committed to change. When the Council abolished these committees, halfway through our study, agents perceived a decline in their efficacy, the motivation to act diminished and frustration installed. This is despite the clear intention members of the community had regarding what they wanted to achieve through their engagement and action:

> In the past, I think it used to be a question of let's see what we can get. At the present, I think it's much more the communities are saying let's see what we can do, and we may use many partners… the premise that we will do, we will drive, we will direct and this is very healthy. (Community member, interview # 6)

The above statement points to a form of entrepreneurship or the ability of social actors (sometimes acting as a collective) to purposefully influence the local context as suggested by Döringer (2020). A clear intention of how to deal with future hazards by devising a plan now was also identified as an important step towards successful action, including by setting aside necessary funds to support the implementation of various responses:

> What we could do to deal with the shock of sea level rise would be to have a precautionary sea level raise estimate and to start redesigning our infrastructure with that in mind. You would start now to spread the cost over decades rather than have to deal with a shock, let's say relocate an entire sewage treatment plant or sewage system within a month. (Community member, interview # 2)

> I think that you need to always have a set of funds set aside for that, so that we could manage any disasters, because let's be real, disasters do happen, and they can happen anytime. We are in a high-risk area, so we know we're in a high-risk area with the sea level rise, fires, because we've got lots of bushland around us. We need to have a strategy where we can respond to emergencies. (Elected member, interview # 1)

What is notable in the two quotes above is the capacity of actors to plan for the future, and their understanding that changes could occur in a variety of forms and intensity.

4.3 | Banking on reflection to enact unconstrained action

Emirbayer and Mische (1998) specifically discussed that the temporal dimension related to agency may enable actors to influence structures, so the ability to think about the future presents an important mechanism to plan for and enact anticipatory adaptation. This characteristic also points to the imaginative, unconstrained aspect of agency, and, in our case, its importance to enable actors to deal with future shocks and surprises:

> Given that what I see in 2019 is that it's not going to be an orderly transition. I think that the plan has to include a reimagining of our future and it has to include conversations around how are we going to cope with chaos. (Elected member, interview # 3)

Reflection was the most notable agency attribute identified amongst our interviewees. For example, some reflected on the shortcomings of climate change being framed as an environmental issue often closely associated with green politics:

> We've made a massive mistake on climate change, framing it as an environmental issue. It should never have been framed as an environmental issue and at the moment environmental groups are doing all the heavy lifting on climate change, and that's just madness, because what it does to those conservative councillors is turn it into a green issue, and because there's such a politicisation between the green party and their political opponents, that means no action happens… we should have gone down the health route at the very start… (Community member, interview # 2)

The lack of action, or willingness to act, on climate change at the local government level, to some extent, reflects an overarching polarised discourse set at the Australian federal government level for the last two decades (Christoff, 2005). While most of this polarisation revolves around reducing greenhouse gases emissions and shifting away from the country's economic dependence on fossil fuels, it also impacts on proactive action towards adaptation to current and future climate change impacts. In particular, this polarisation, and politicisation, of the climate change issue cascades through jurisdictions and results in an ever ending responsibility shifting game (Serrao-Neumann et al., 2014). Nonetheless, some interviewees could see beyond this barrier and point to a less grim future, albeit recognising the challenges that laid ahead:

> I see it as a challenge and I have significant faith that humanity will face these challenges and come to a solution. There will be an awful lot of angst, injury, damage done in the process but there will be a way through it ultimately, but it's going to be very difficult and the longer we delay the more difficult it will be and it will manifest itself economically first. (Community member, interview # 4)

4.4 | Using dimensions of time to devise climate change adaptation policies

There were many elements in the scenario planning process, which indicated participants' projectivity capacity related to both anticipatory identification and experimentation. With respect to anticipatory identification, the use of past experiences to inform future trajectories was observed in the way participants identified and discussed a range of critical drivers of change affecting their area during the scenario planning workshop # 2, including political, social, economic and environmental drivers (see Table 2). Using political drivers as examples, past experiences may include how decisions are being driven by

TABLE 2 List of most important and most uncertain drivers of change identified by project participants

Category of drivers	Examples
Political	Move towards participatory democracy increases community engagement Changing of political and regulatory situation at the regional level (e.g., creation of regional government) Lack of trust and disillusion in institutions (corporations, authorities) Impact of councillors' position on decision-making
Social	Community based land-use planning improves villages and environment Emergence of community cooperatives Extreme migration to Australia
Economic	Continued focus on economic growth Negative economic impacts on the local area (no control of big impacts on employment, resilience, living) Collapse of local agricultural industry (dairy, beef)
Environmental	Challenges to sustainability of local agriculture in light of environmental change and population growth Occurrence of geological events (earthquakes, tsunamis) Pressure on water security (drought for 10++ years) Rapid sea-level rise

individual interests—a point also confirmed by interviews in section 4.1, and the lack of trust in institutions. Nevertheless, albeit negative, these past experiences did not prevent the identification of more positive future trajectories such as an increase in community engagement through greater participatory processes, or the creation of a regional level government which could support decisions of a more strategic nature for the whole region as opposed to individual solutions for many of the townships comprising the Shoalhaven.

Participants also helped outline potential future trends for the two scenario narratives selected (Chaos and All Options) for testing future strategies. These included trends related to population and demographics; community; policy, regulation and governance; environment; climate change; economy; technology; and overall positive and negative aspects associated with each scenario (see Table 3). Notably, narratives on climate change aspects for the All Options scenario identified progress on adaptation, including managed retreat of communities and infrastructure at risk from sea level rise, as well as reduction in greenhouse gases emissions.

Regarding the experimentation dimension of projectivity, during workshop # 4, participants used the two abovementioned scenario narratives to carry out a wind-tunnel test of future policies to identify changes needed at present to ensure those policies would be effective in the future. For example, in line with the proposed vision statement, participants came to the conclusion that two policies related to the need to maintain the region's environmental value and enhance foreshore management were not strong enough to enforce the preservation of environmental assets and secure a better balance between environmental values and development. They thus recommended that both policies needed be more prescriptive with intended outcomes better defined along with improved implementation procedures based on a cyclic planning approach as opposed to a stop-start approach. These required the development of proper instruments to ensure compliance, and frequent reviews to keep pace with development [urbanisation] rates and pressures.

More evidence of the experimentation dimension was observed in the adaptation pathways planning stage of the project. This included the identification of future shocks and surprises, turning, tipping and trigger points to help achieving the vision for the region (see Table 4), and a range of proposed policies following the backcasting exercise (cf. Kok et al., 2011) covering topics such as climate and sustainability, Indigenous engagement and participation, and natural heritage. For example, one of the climate and sustainability proposed policies included the review and update of the Council's Adaptation Plan to reflect the latest information on climate change related risks across different sectors to build the region's adaptive capacity. This included accounting for climate change to manage development within region as well as its assets.

5 | DISCUSSION

Literature on agency identifies knowledge deficit as one of its key barriers (Dietz & Burns, 1992; Giddens, 1984). Similarly, the climate adaptation literature lists problem identification, gathering of information and problem definition as barriers in the adaptation understanding phase (Moser & Ekstrom, 2010). Our findings showed, however, that such barriers were not an issue hindering adaptation in the Shoalhaven. There was great individual capacity and knowledge amongst the participants to not only understand how the physical and social world around them had changed, and will continue to change, but also the need for action to be taken now to deal with future changes. In particular, participants identified the important role of planning in addressing future challenges likely to affect their local context, including rapid sea level rise. It is important to note that while participants in the project had a high-level of knowledge about their local area, they were self-selected to be involved in the research project and thus may not necessarily reflect the wider community's level of knowledge around future environmental challenges facing their region. Many have been visiting the area as tourists for decades before choosing to become more permanent residents to the area, with the main point of attraction being the environmental amenities provided by the Shoalhaven. As seen in other studies (Masterson et al., 2017; May, 2019; Messer et al., 2015), it is potentially this strong place attachment that motivated them to self-nominate themselves to the advisory committees as a way of helping to maintain and enhance the Shoalhaven's natural features and protect them from future climate change impacts.

TABLE 3 Narratives for the all options and chaos scenarios—Plausible futures for 2045

All options	Chaos
Overview: A scenario characterised by sustainable and beneficial economic change and managed and informed sea level rise response.	*Overview*: A scenario underpinned by unsustainable and restricted economic change and unmanaged and uninformed response to sea level rise.
Demography: Moderate population growth- increasing to high over time, ageing population, and increased migration and social diversity.	*Demography*: Moderate population growth, ageing population, high rates of immigration and pressures on ageing infrastructure.
Community: Certain sectors of the community are highly involved in the decision-making process, social complacency within certain sectors of society over time as government is perceived to be doing a good job, decline in homelessness and poverty, new jobs and training opportunities as the economy shifts towards sustainable industries.	*Community*: Rise in 'tribalism' and self-sufficiency, regression in social achievements, increased homelessness.
Governance: Strong and prescriptive policies aimed at tackling climate change, federal level policy-multi-partisan, all sectors are working proactively and collaboratively to respond to climate change, inclusive and proactive leadership, gradual shift towards participatory democracy.	*Governance*: Pro-growth agenda with little regard to carrying capacity, stagnate policy making on climate change related issues, loss of support and funding for community involvement in decision-making, centralised decision-making processes, ad hoc approach to economic and social development.
Environment: Natural assets under pressure from climate change, increased pressure on ecologically sensitive areas as development moves from climate vulnerable zones, high levels of disposable income increase consumerism and the potential for environmental harm from disposable practices.	*Environment*: Public funding for environmental protection is suspended, ad hoc growth and development causing significant environmental degradation, climate change impacts are noticeable.
Climate change: Impacts are noticeable, but communities are adapting, decline in per-capita greenhouse gases emissions in Australia, re-location of many communities and infrastructure as a result of rapid sea level rise, strong emphasis on mitigation efforts for managing sea level rise and urban heat island effect.	*Climate change*: More frequent severe weather events (including storms, floods, and fire), increase in per-capita greenhouse gases emissions levels, Australia is held responsible for inadequate action on climate change on the global scale.
Economy: Robust, yet sustainable growth, rapid investment in innovation and technological solutions to climate change, slight decline in funding for education and health, high rates of superannuation, income levels stable, but expenses high.	*Economy*: Increased disparity between the 'haves' and the 'have-nots', decline in economic growth as losses due to stranded assets begin to materialise, shift towards alternative models of investment and funding (driven by innovative industries and entrepreneurs).
Technology: Focus on engineering solutions to climate change, strong investment in research and development of new technologies.	*Technology*: Emerging niches and business opportunities but with limited public funding, increase in grassroots and low-tech technological innovations.
Positive trends: Readily available government funding to support climate change mitigation and adaptation strategies, multi-partisan support for action on climate change (across all levels of government), leading scientific research is done in Australia, infrastructure is removed from high risk areas and adequate compensation arrangements are adhered to, informed and equitable distribution of resources, citizen involvement in decision-making is encouraged and supported, decline is social inequality, decline in crime.	*Positive trends*: Emerging business opportunities, opportunities for innovation and niche technologies, rise in self-sufficiency, increase in creative solutions, delegation of responsibilities to private ownership.
Negative trends: Hard engineering solutions at the expense of the environment, social complacency, potential for high taxation, increased population in the Shoalhaven, increased subdivisions and pressure on environmentally sensitive areas, high income leading to greater consumerism and resource exploitation.	*Negative trends*: Environmental degradation, polarised and dissatisfied community, widening social inequalities, critical infrastructure compromise, relegation of science to the back sit, increase in crime.

While being able to plan for future changes may indicate a significant element of adaptive capacity, the implementation of plans, as argued by Tuominen and Lehtonen (2017), depends on actors' capacity to mobilise collective action along with 'the interests and resources of other agents'. This implies a substantial negotiation effort to bring parties and sectors of the community together to work towards a common goal (e.g., climate change adaptation). Our findings related to agency efficacy showed a general feeling of disempowerment to successfully confront, and change, the existing political tradition of the area. Participants felt they were unable to influence decisions even when supported by sound knowledge or evidence of the area's declining environmental conditions, and pressing climate emergency. In particular, while practitioners' work was generally perceived as being great and capacitated to make good decisions about strategic issues, their work was often being crushed or dismissed by the conservative majority of councillors who wanted to maintain the status quo. Many gave the example of the dismantling of the expert advisory committees to illustrate how politicians had the last say, and how little council staff or the community could influence final decisions. This may be a result of what Biesbroek et al. (2014) coined a 'conflict infection

TABLE 4 Examples of shocks and surprises, turning, tipping and trigger points identified by project participants

Shocks and surprises	Turning points (significant changes)	Tipping points (critical thresholds)	Trigger points (circumstances causing the event)
Unpredicted combination of coastal inundation	Events and mitigation costs exceed Council's financial capacity. Acute risk identification through research and monitoring.	Coastal assets need to be relocated (e.g., childcare centre). Worst case events exceed predicted events. Insurers' demand. Costly risk mitigation projects.	Events occurring more often and with more intensity.
A social transformation towards a positive 'common good approach'	More self-reliance in communities networking throughout the Shoalhaven.	High numbers of community events. Competition for executive positions in community organisations, including Council.	Community takes responsibility for changes.
A significantly changed environment in a short period of time (e.g., geological event)	Event so extreme that natural environment cannot recover. Loss of multiple local population of plants and animals leads to extinction on a state and federal scale. Loss of forests lead to significant run off to significantly impact water quality: biodiversity (aquatic), drinking (potable), recreational uses. Isolation of species. Significant decrease or increase temperature leading to a shift in biodiversity or loss of species.	Failure of agencies to cope with changes. Major habitat and species loss.	Bushfires, floods. Coastal erosion also impacting estuaries. Increased frequency of these events. 'Prediction' and modelling can no longer be relied on because weather events have become so unpredictable and not following historical patterns.
Sudden, unpredicted change in visitation numbers to the region (e.g., tourists, visitors)	Sudden pattern changes in holiday accommodation occupancy rate. Increase in long-term tenants.	Tourism businesses closing/changing. Plans for road infrastructure shelved. General economic constriction.	Climate events. Global economy.

mechanism', and reflect a behavioural barrier to local action related to individual personalities of people in leadership positions as discussed by Burch (2010). On the one hand, the two committees were newly appointed by the elected council to guide their work on sustainability, natural resource and flood management. On the other hand, as they held councillors to account it exposed divisive interests (some lead by conservative elected members occupying seats for decades) which continued to escalate in the years to follow (Fuller, 2020).

There is no doubt that the dismantling of the committees took a toll on community members' interest in continuing to participate in the project based on workshop attendance numbers. Despite this, some acknowledged in the interviews that their community was still viewed as playing an important role in decision-making and planning. Those held very clear intentionality as to what they intended to achieve as depicted in the vision statement they created for the region. They also knew that for the vision to be achieved it required overcoming many hurdles beyond the political culture. They would also need to deal with future shocks and surprises thrown at them, including those associated with the uncertainty inherent to climate change impacts. As argued by Tschakert and Dietrich (2010), adaptive capacity encompasses actors' ability to learn from past experiences to both generate responses to change and innovation. The authors also emphasised the role of anticipatory learning in enabling the understanding of future impacts before they occur. Hence, the ability of project participants to foresee abovementioned challenges indicates that they had the capacity to reflect upon and learn from past experiences, and use those to shape future actions.

It was their ability to reflect on past experiences, and current and future challenges that shaped how participants discussed options for making their communities better adapted to climate change impacts in the future. This also indicates the presence of elements of projectivity capacity amongst participants, especially anticipatory identification. Unlike propositions from other studies involving scenario planning (Rickards et al., 2014), our findings confirmed that project participants understood the political nature of decisions and that the local government they were inserted in was neither stable nor static; but rather polarised and chaotic (Fuller, 2020). They concur with findings from Lipiec et al. (2018) whose study concluded that the most effective policies identified through scenario analysis were unlikely to be implemented due to governance structures and not the quality of evidence provided to decision-makers. Findings are also in line with Butler et al. (2020) recommendations that scenario planning processes

need to be cognisant of the political context in which decisions are made.

Finally, as specified by Emirbayer and Mische (1998), the temporality and reflexive aspects play an important role in the actor's agency, and these are especially relevant in the climate change context considering the uncertainty inherent to impacts intensity and frequency. It is difficult, however, to determine the extent to which the scenario planning process helped to further develop participants' projectivity capacity, and mechanisms to asses this remain elusive (Burt & Nair, 2020). From an anticipatory identification perspective, as seen in other studies (Bartholomew, 2007; Rickards et al., 2014; Serrao-Neumann & Low Choy, 2018), dealing with future uncertainty and unforeseen changes was a difficult question for most people to answer during the interviews; whereas outputs from workshops showed a different picture. This finding aligns with Perez (2020) argument that scenario planning provides an opportunity for individuals to collectively discuss and solve complex issues. From an experimentation perspective, during the scenario planning and adaptation pathways planning processes, participants were able to discuss, identify and evaluate how policies could address changes in the future, and how those could be implemented. Our findings concur with Gidley et al. (2009) who argued for social actors to be given opportunities to discuss and create their preferred future, and better understand their adaptive capacity. This includes further developing their ability to deal with the temporality aspect to, hopefully, improve their agency.

6 | CONCLUSIONS

This paper aimed to contribute to agency literature related to climate change adaptation by investigating how past social and environmental change was understood by a purposely selected group of social actors; and, exploring how scenario planning may help actors apply their understanding of changes over time to devise policies for climate change adaptation. Our findings indicate that knowledge about natural processes was not a barrier to the actor agency as they all had a very high understanding of how past and future environmental impacts affected, and were likely to affect, their local area. They also had a very good understanding of impacts from past and future social changes, along with the political context in which they were operationalising action. The later, in particular, was highlighted as the major barrier to their capacity to anticipatory adaptation. Many also struggled to see this situation changing in the future and confirmed that their main obstacle to action was due to the structural nature of these barriers, including unconducive governance towards climate change adaptation.

Our findings also indicated that tensions exist regarding people's ability to deal with a more long-term future. On the one hand, interviews showed a tendency towards thinking more from a short-term perspective. On the other hand, both the scenario planning and adaptation pathways planning processes enabled participants to think from a long-term perspective. In particular, without holding a 'crystal ball' to predict the future, many of the features of their scenario narratives, such as multiple simultaneous disasters, eventuated rather quicker than expected. Impacts, thought of as only possibly occurring in a distance future, swept through their region without allowing any adequate response or recovery time. If this is the new 'norm', then more than ever, we need to urgently instigate anticipatory climate change planning and implementation, including support for local actors' agency.

There are some important implications from these findings, which need to be considered if we are to improve our preparedness to deal with climate change impacts. We are seeing an increased delegation of responsibility to communities to plug gaps previously provided by government services in disaster responses, especially in Australia. In light of the increased magnitude of extreme weather events, this will be challenging for communities if their trust in their own agency efficacy continues to be eroded by current political settings. Ignoring the urgency of actions now, including the lack of support for local actors' agency, may backfire in the future. An exemplar of this challenge is the recent series of disasters that affected many regions for which there was little preparedness even from the combat agencies trained to deal with these extreme situations, and the recovery efforts have been very slow to realise as the pandemic added another stressor. As these extreme events are becoming more frequent, with many already falling outside the worst-case scenario envelope, there is the need for strengthening the capacity of actors to exercise future thinking to aid proactive adaptation action. This is particularly important as a many of the previously used tools to predict weather events such as meteorological models have been unable to deal with these significant, unprecedented changes. Decisions, however, will still need to occur in a timely manner and may need to be based on not so accurate projections.

Finally, findings from this research are not presented without limitations. In particular, findings may not be scalable or transferable because the research was confined to only one locality, it involved a small pool of participants, and community members self-selected themselves to be involved in the council's committees. The conclusion of the project was also affected by a string of environmental and social crises, which overwhelmed the local area and their residents. There are also many ways of carrying out scenario and adaptation pathways planning. Future research could confirm whether scenario planning and adaptation pathways planning could inform and guide decisions in an effective manner, and whether some methods are more effective than others do improve participants' future thinking skills. Research of this type, however, require longer timeframes as the effective impact outputs from scenario planning and adaptation pathways planning processes are not immediately implemented nor incorporated in adaptation policies outside formal review cycles.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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