



What's the problem in adaptation pathways planning? The potential of a diagnostic problem-structuring approach



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ABSTRACT

Adaptation Pathways (AP) is receiving increased theoretical and practical interest as an approach to planning for climate change that engages with conditions of uncertainty. Participatory action research with environmental and natural resource management (NRM) planners, revealed that the contested, complex nature of NRM challenges the ready utility of AP planning implied by many other published examples. Findings indicate this is because current AP approaches do not yet engage with contested goals and knowledge, and tend to assume that actions to achieve goals are largely technical and unproblematic. Drawing on these findings, this paper develops an argument for a diagnostic, problem-structuring approach as one way of improving the utility of AP planning in contested, complex problems. We posit this approach could help guide selection of 'fit-for-problem' analysis and planning methods to develop practicable AP plans that support efforts towards transformational adaptation. Issues of engaging with diverse problem frames, scientific contestations, and institutional dimensions of governance remain potentially fruitful research foci in AP planning.

1. Introduction

Adaptation Pathways (AP) planning is increasingly presented as an approach to planning and decision-making under conditions of uncertainty (Denton et al., 2014). Concurrently, there are calls for theoretical underpinnings of AP to support efforts towards societal transformation across spheres of on-ground and governance practices (Voß and Bornemann, 2011; Wise et al., 2014; van der Brugge and Roosjen, 2015). This paper seeks to contribute to these calls through findings from participatory action research (PAR) with environmental and natural resource management (NRM) planners that explored the utility of AP planning in NRM. We found that while AP is conceptually appealing and theoretically tractable, the contested, complex nature of NRM challenges the ready utility of AP planning implied by many other published examples. Findings suggest this is because most current approaches to AP planning do not yet engage with issues of contested goals and knowledge, and associated institutional dimensions of governance; providing limited guidance in enabling transformational adaptation that seeks to address root drivers of vulnerabilities and poor sustainability (Pelling, 2011; Rickards, 2013). Moreover, questions remain as to engagement with the implications these issues present

choices of planning and analysis methods in AP planning, including development and use of scientific knowledge (Turnhout et al., 2008).

Drawing on theoretical and empirical findings from the PAR project, this paper proposes diagnostic, problem-structuring as one way of addressing the identified limitations and improving AP utility in contested, complex policy problems. To contextualize the empirical work, the paper first introduces the concept of AP planning, before outlining the PAR project that allowed a dialogical understanding of the needs of NRM organisations in planning for climate change and analysis of AP planning utility in such contexts. Discussion of these findings informs an argument for a diagnostic application of existing problem-structuring approaches in policy and governance (Hisschemöller and Hoppe, 1995; Turnhout et al., 2008; Hoppe, 2011; Leith et al., 2014) in AP planning. We posit that such an approach could help improve the utility of AP planning in NRM at least, by guiding methodological choices in developing practicable AP plans for NRM that support efforts towards transformational adaptation.

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2. Context: NRM and adaptation pathways planning

2.1. Natural resource management (NRM)

Australia's approach to NRM¹ is guided by the concept of integrated catchment management (ICM), which involves 'regional, holistic approaches to environmental decision making' (Ewing, 2003: 393). It is characterized by diverse management and jurisdictional overlaps, biophysical complexities and feedbacks, multiple values and perspectives, and fragmented institutional settings (Cork et al., 2007; Lockwood and Harwood, 2017). Therefore, NRM organisations such as Catchment Management Authorities (CMAs) in the state of Victoria, guide, facilitate, and connect actions across a multi-level governance system of federal, state, and local governments, NGOs, community groups, and local landholders and business owners. Integration, coordination, and attention to multi-scalar (spatial and temporal) phenomena across this complex governance landscape already necessitates an adaptive approach to NRM (Lemos and Agrawal, 2006; Lockwood et al., 2010; Potts et al., 2016).

Climate change is projected to compound the complexities and challenges of NRM by exacerbating existing threats and pressures (CSIRO and BoM, 2015), and intensifying tensions surrounding trade-offs between stakes and values (Wallis et al., 2015), and competing uses of water, land, habitat, and biodiversity (Dunlop et al., 2012). Alongside associated but largely indeterminate changes in future values, knowledge, and politics, there are uncertainties about scales, timing, and nature of potential implications of climate change that are largely irreducible through scientific investigation (Dovers and Handmer, 1992; Walker et al., 2003). For example, there are uncertainties regarding how ecosystems might respond to changes in fire regimes (Bosomworth and Handmer, 2008), phenology (Cleland et al., 2007), diseases (Gautam et al., 2013), and regarding implications of such changes for many human interests (Noble et al., 2005; O'Brien et al., 2008; Lennox, 2015). Consequently, the stationary basis of much NRM (Bodin and Wiman, 2007; Milly et al., 2007), enshrined in objectives to maintain and enhance existing states, may become progressively infeasible or suddenly irrelevant (Dunlop et al., 2013). Planning for climate change in NRM therefore demands capacities for decision-making under conditions of uncertainty alongside management of proximate environmental, social, and governance issues, all with a view to a longer-term, transformative agenda.

2.2. Adaptation pathways (AP) planning

Because the future will inevitably be different from those hypothesized, adaptation plans using a singular 'preferred' pathway or a 'most-likely' scenario are destined for failure (Walker et al., 2003). AP proponents argue it addresses this challenge by encouraging exploration of option robustness across multiple plausible futures, and identifying tipping and trigger points across these (Haasnoot et al., 2012, 2013; Kwakkel et al., 2015). Tipping points can be biophysical, where the magnitude of change is such that current management strategies will no longer be able to meet their objectives (Kwadijk et al., 2010), and socio-political in which changing societal discourse and institutions may change management preferences (Werners et al., 2013). Trigger points help identify required lead times for decision-making and implementation (Haasnoot et al., 2013), guiding identification of actions that may be implemented across various timeframes (Werners, 2013).

Necessarily iterative and deliberative with insights gained throughout potentially leading to reconsideration of preceding choices

¹ We refer here to NRM in its Australian usage that embraces watershed-scale (or catchment) management, wetlands and floodplains; biodiversity and habitat conservation; sustainable soil and agricultural management; irrigation and salinity; water quality and supply; pest plant and animals; rural-urban interface issues; and sustainable regional development, and coastal management (Lockwood et al., 2010).

AP planning comprises five broad stages familiar across most strategic planning practices:

- Define goals and objectives
- Understand the current situation
- Analyse possible futures
- Develop adaptation pathways
- Implement, monitor, evaluate, report, and improve

This conceptual resonance with existing planning processes led the research-practice team to explore its utility in planning for climate change in NRM.

3. Exploring AP planning in NRM through participatory action research

This paper draws from a larger 3 year project involving collaboration with nine NRM organisations across south-eastern Australia (Tasmania (n = 3), Victoria (n = 5) and New South Wales (n = 1)), to support research and capacity building in developing and implementing climate change plans (Wallis et al., 2017). The paper focuses on the five Victorian coastal catchment management authorities (CMAs) of that partnership as they were seeking to develop climate change plans, unlike the other organisations that, for various reasons, were more concerned with developing generic NRM plans.

While climate change impacts are likely to vary within and between these regions, they face broadly similar climatic changes including increased intensity of extreme rainfall events, continued mean sea level rise and height of extreme sea-level events, harsher fire-weather, and generally less rainfall in the cool season with possible but less clear changes to summer and autumn rainfall (CSIRO, 2016). Despite a diversity of potential implications, the CMAs typically framed climate change as a problem that "cuts across" all NRM activities and assets.

In seeking to reconcile the supply of research with user demands, (cf McNie, 2007; Sarewitz and Pielke, 2007), we adopted a participatory action-research (PAR) approach that allowed a flexible, co-learning process (Badham and Sense, 2006) in which our NRM colleagues were the primary source of questions, dilemmas, and empirical data, and co-collaborators in testing and evaluating insights (Hill et al., 2010; Huntjens et al., 2015). Early scoping exercises involved focus groups and individual interviews with over 50 participants from across the 9 regions, to gain detailed contextual understanding of regional similarities and differences across policy, governance, and practice challenges. From there, a collaborative partnership of 4 researchers and a planner from each of the 9 regions developed through a series of formal and informal activities. These activities included interviews (I1-24), workshops and planning meetings (W1-21), online and paper-based surveys, and innumerable emails and phone calls. Interviews focused on questions of current framing, activities, and barriers to adaptation planning and action in the region. All were recorded (with consent) and transcribed. Observational notes were taken during workshops regarding key themes or issues, attitudes, responses, and commonalities and differences between regions. These notes were kept on a shared drive and used to focus reflections and analysis throughout the study (Wallis et al., 2017). A web-based, interactive 'Portal' (Wallis et al., 2015) allowed documents to be tested and revised 'live' by researchers and participants alike (Wallis et al., 2017).

After the larger project's early scoping exercises, two Victorian workshops focused on identifying agreed processes, areas of need, and timelines. A third workshop used an existing guide to adaptation planning – the 'Adaptation Navigator' (www.vcccar.org.au/navigator) – as a checklist to identify areas where the NRM planners considered they needed additional support. This identified four sub-projects: (1) planning for uncertain futures; (2) biodiverse carbon plantings; (3) synthesis of climate change impact literature; and (4) ongoing learning and collaboration.

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