

Examining 'inclusiveness' in adaptive natural resource management

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Abstract

Adaptive management claims to offer reflexive options for environmental management decision-making. In recent times, the importance of including both 'expert' scientific and stakeholder knowledge through more participatory procedures has been emphasised. However, there has been little research on the practical challenges of 'inclusiveness', in particular how management institutions incorporate the relevant, multiple and diverse ways of thinking of stakeholders in practice. This paper addresses this deficit by examining Indigenous knowledges as relevant contributors to the adaptive management process. It reports on research undertaken in 2006 as part of an honours project, investigating inclusiveness in management of the Barmah Forest in Victoria, which is one of the six Murray Darling Basin Commission designated Icon Sites along the Murray River. The paper argues that exclusion of relevant knowledge bases and institutional rigidity are common problems of adaptive natural resource management. Indigenous (Yorta Yorta) knowledge is used as a case study to illustrate the ways in which institutional and individual ways of understanding can affect stakeholder representation in adaptive management in natural resource management negotiations. Ways to address these issues include: (re)examining institutional structures, understanding different ways of thinking, and ways forward for adaptive management, through instigating considered and appropriate 'process' and (re)conceptualising scale. These stages address underlying practical hurdles to adaptive management and reflexive thinking in a cross-cultural context, however the suggestions are also relevant to including all stakeholders in natural resource management.

Keywords

Adaptive management, governance, Indigenous knowledge, inclusive decision-making processes, scale

Introduction

What is the link between adaptive management and inclusiveness?

Adaptive management (AM) relies on reflexive evaluation of the success of particular natural resource management (NRM) decisions. Including stakeholder and scientific knowledge in an integrative, and ultimately successful manner, relies on the outcome of the decision-making process being responsive to both social and ecological concerns (Waitt *et al.*, 2006). However, when certain ways of thinking, or knowledges, are excluded from the decision-making process, the ability to adaptively respond to these concerns is constrained. Given the increasing awareness that objective stances on NRM and thus monolithic ways of dealing with environmental issues do not exist (Castree, 2004), assumptions held within the decision-making process regarding 'legitimate' and credible forms of contributing knowledges (especially regarding Indigenous ways of thinking) cause much tension for a participatory AM process. NRM and AM literature emphasises the need for stakeholder knowledge to be included in participatory adaptive management (Walker *et al.* 2002; Berkes *et al.* 2003). However, dominance of some ways of thinking over others (McLain & Lee, 1996) and institutional rigidity (Allan & Curtis, 2005) have been recognised as barriers to this goal. Despite this, little research has concentrated on how these issues link to inclusiveness as an essential component of adaptive management (see also Stankey & Shindler, 1997). In any environmental system, there are multiple ways of thinking about specific issues that are relevant to management of the system. Furthermore, as the subjective element of NRM gains recognition, ways of dealing with multiple forms of thinking are required. Investigating how adaptive management systems respond to different forms of relevant knowledge offers opportunities for better understanding how to generate sustainable management approaches. This paper reports on inclusion and exclusion of different knowledge systems in a management system that claims to be adaptive. The responses of a management system to the indigenous knowledge the area's Traditional Owners, the Yorta Yorta Nation, is considered.

Indigenous knowledge

Some previous Australian research has considered Indigenous people and knowledge as relevant to adaptive management. Jackson (2005) and Lane (2006), for example, have considered issues of cultural values in water in the Northern Territory and Aboriginal involvement in land use planning respectively, providing some guidance on Indigenous inclusion into NRM. Indigenous ways of thinking and ‘caring for Country’ are fundamentally different to mainstream NRM and other stakeholder understandings. This paradigmatic conflict creates barriers to Indigenous inclusion in management. With the exclusion or inadequate inclusion of relevant knowledges, managers’ and management institutions’ ability to respond to these environmental concerns is severely restricted. Given that, responsiveness to perturbations and complexity – at the core of managing adaptively – is restricted and, consequently, the adaptiveness of management is called into question. The case for Indigenous knowledge is used to represent inclusion of an entirely non-scientific way of thinking, however, this can also be applied to including other stakeholders in adaptive governance.

Inclusiveness in an adaptive management framework: the case of the Barmah Forest

Barmah Forest comprises part of the combined Barmah-Millewa Forest, which is located on the Murray River approximately 30 kilometres upstream of Echuca in Victoria (Figure 1) and lies between the townships of Echuca, Deniliquin and Tocumwal. The Barmah-Millewa Forest is within the Murray Darling Basin, and according to the Barmah-Millewa Forest Asset Management Plan (AEMP) for 2005-2006, forms one of the six Icon Sites for management along the Murray (MDBC 2006). This report also states that Barmah-Millewa Forest is ‘managed according to adaptive management principles’ (MDBC AEMP, 2005).

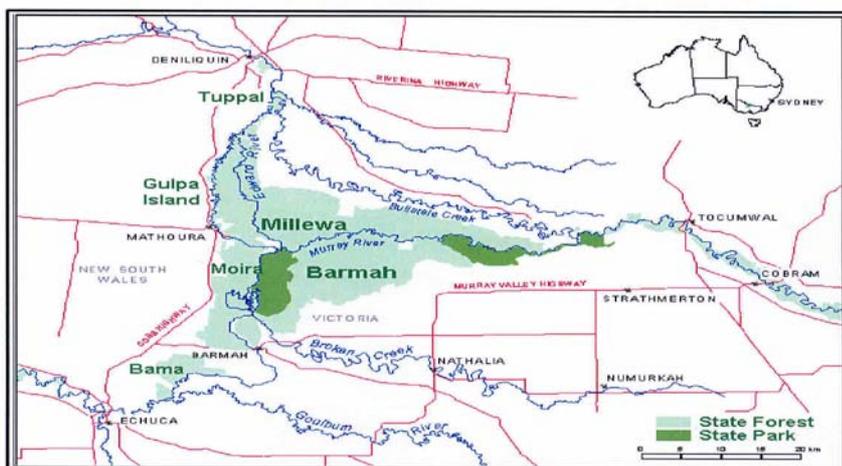


Figure 1. Location map of Barmah-Millewa Forest (Source: Department of Sustainability and Environment: River Red Gum Ecology Unit, 2006).

The Barmah-Millewa Forest is the largest River Red Gum Forest/wetland in the world (MDBC, 2006), and forms a triangle-shaped section of River Red Gum wetland. The Forest is split into State Forest and State Park zones (Figure 1). The Yorta Yorta Nation are Traditional Owners for the Barmah Forest, as acknowledged by the Victorian State Government in the Yorta Yorta Co-Management Agreement signed in May 2004. Management of Barmah Forest is undertaken by a ‘Coordinating Committee’ comprised of The Murray Darling Basin Commission (as directed by the Murray Darling Basin Ministerial Council), The Living Murray Initiative, the Department of Sustainability and Environment, the Goulburn Broken Catchment Management Authority (which provides an alternate Chair of the Asset Consultation Reference Group) and Parks Victoria. The management system is explicitly represented as relying on adaptive management principles (MDBC AEMP, 2005).

Methods

Using a combination of document analysis, participant-observation and semi-structured interviews with key figures in the Murray Darling Basin Commission, Department of Sustainability and Environment, Catchment Management Authorities, Yorta Yorta Nation Aboriginal Corporation and academics involved in Indigenous studies, this research investigated two case study knowledge groups, which were used to determine responsiveness and inclusiveness of the adaptive system: Indigenous knowledge and geomorphological knowledge. Fluvial geomorphology was used as a second case study for the honours thesis based on this

research (Wilcock 2006). Geomorphology was also found to be a relevant, but excluded, contributor to Barmah Forest at the management level. For the purposes of this paper, only Indigenous (Yorta Yorta) knowledge is used to exemplify the need to be responsive to multiple (and particularly stakeholder) knowledges. Fourteen interviews with key stakeholders, managers and scientists involved in managing Barmah Forest were held over a two-month period. Triangulation between these methodologies (document analysis, participant observation and interviews) and subsequent analysis of these results found that the current environmental management is not effectively representing or responding to Indigenous (or geomorphological) concerns. AM in the Barmah Forest case was found to be underdeveloped.

Report on the findings of the research

The research suggests that institutional management bodies should first reflect on the ways in which knowledge is integrated into adaptive management frameworks within their own organisations, as outlined in Allan and Curtis (2005). If ‘including’ stakeholders is a priority, then decision-makers and managers must understand and reflect on their own ways of thinking before attempting to include multiple perspectives. Once institutional rigidity is transcended, including other knowledges and adaptive management can operate iteratively, and can offer a more flexible and truly adaptive response to NRM issues. This involves:

- (a) Understanding the ways in which institutions operate (i.e. assess the level of internal institutional rigidity)
- (b) Understanding (and respecting) the nature of the different knowledges which are to be integrated, and thus
- (c) Instigating an appropriate framework through which different perspectives are included in a considered way, which respects and forms solid foundations for responding and integrating different understandings.

These three steps need to occur because multiplying stakeholder numbers does not necessarily equate to multiplying ways of thinking. Especially regarding the inclusion of Indigenous – in the case of the Barmah Forest, Yorta Yorta – concerns, much tension arises from institutional arrangements where community representatives are chosen by authorities to speak and act on behalf of constituencies with whom they have no authority or appropriate standing in customary law. Not only do NRM managers need to understand how different knowledges can contribute to decision-making, they also have to integrate and represent them in a considered and appropriate manner for management to be responsive to these concerns, and thus adaptive (e.g. Berkes *et al.* 2003).

Stage 1: Reflecting on institutional structure and perceptions

Command and control approaches in NRM decision-making frameworks can have detrimental effects on managing in an adaptive manner (Rogers, 2003). Engineering mindsets which focus on *only* ‘getting things done’ in a linear fashion (eg delivering water to specific customers and uses (and not being privy to *how* this is undertaken), can cause tension between management outcomes and adaptive process in decision-making. Implementing ‘learning by doing’ requires a mindset capable of assessing particular decisions critically. Yet, command and control mentalities, or institutional rigidity (by their very nature) restrict this reflexive (and adaptive) capacity (Rogers, 2003; Allan & Curtis, 2005). Adaptive management suffers under these conditions, and often decisions are quickly left by the wayside in the next attempt for a ‘quick-fix’, without understanding the opportunity that has been lost in understanding fundamental process relationships. In this way, command and control mentalities which encourage forward-movement may over-emphasise ‘progress’ such that important stakeholders, and even other scientific knowledge, are misunderstood and (sometimes even subconsciously) excluded as irrelevant by decision-makers. These exclusions might well not be intentional, but the effect is the same: they undermine a system’s capacity to respond reflexively and adaptively to specific stakeholders.

Poor recognition and understanding of underlying ontological differences in NRM systems (Howitt & Suchet-Pearson, 2006; Wilcock, 2006), create barriers to trust-based working relationships. This is well illustrated by the case of Indigenous (Yorta Yorta) knowledge in the Barmah Forest example. One simplified, but useful example of the misunderstandings discussed in this research was the supply of water for ‘environmental flows’. Yorta Yorta people do not believe there is a categorical boundary between land and water. Institutionally, however, land and water are separated and supply of water downstream is seen to be ‘progress’ for environment, and thus equated with ‘good’ outcomes for environment and therefore for Indigenous people. Yorta Yorta people do not agree that water being pushed downstream equates to *only* environmental flows, and have pushed for ‘cultural flows’, which encompass land, water and also spiritual

needs. Although this is one of an underlying web of complexities that reflect the ontological differences in this case, after many meetings and discussions, these problems were articulated as 'issues of language'. Trying to come to terms with others want is incredibly frustrating for both managers and scientists who are attempting to fit a number of different pressures and understandings into a resource negotiation. This is not unique to integrating Indigenous knowledge. Failure to progress beyond discovering 'what Yorta Yorta want' in the Barmah Forest is symptomatic of the often *ad hoc* ways in which NRM management procedure addresses other stakeholders' ways of thinking into a predominantly scientific paradigm of 'management'. While it is beyond the scope of this paper to list all the ways which constitute genuine engagement with stakeholders, it is highlighted by the Barmah Forest study that 'inclusiveness' often requires first an examination of institutional flexibility and understanding of in-built assumptions for this to work effectively. Institutions must be able to understand their own underlying paradigms and assumptions before attempting to adaptively integrate different ways of understanding and thinking. Without this acknowledgement of ontological difference as a first step, management cannot hope to reflect or represent other ways of thinking effectively; adaptive management cannot occur in this context. What individuals can do to be able to be well informed in the NRM context will be explained further in the next section.

Stage 2: Understanding (and respecting) different ways of thinking

Adaptive NRM must facilitate community participation since it is community values that provide the context for judging AM. Adaptive institutions, therefore, need to accommodate the different ways of thinking that characterise a community (Jacobs & Mulvihill, 1995) The underlying influence of a reductionist positivism in many NRM institutions (Stankey & Schindler, 1997), mitigates against such accommodation (see also Sarewitz, 2005). NRM cannot be detached from either its socio-cultural or political-economic setting any more than it can ignore its ecological setting. Indeed, NRM needs to be conceptualised as embedded in its context; never value-free, or indeed objective (see also Howitt, 2001). Management decisions about biophysical systems do not occur in a vacuum, nor do adaptive decision systems offer a framework that is untainted by gaps in knowledge. In other words, biophysical, social, political and economic complexity constantly muddies the water of 'clean' and precise 'Science'.

Nevertheless, overcoming internal biases within institutions not only involves internal reflection regarding paradigmatic assumptions and integrating scientific disciplines. True adaptive management also requires decision-makers to have the ability to understand, integrate and indeed represent and respond to other ways of perceiving NRM, i.e. community participation (Mulvihill & Jacobs, 1995). In the Barmah Forest example, Indigenous (specifically Yorta Yorta) knowledge was examined as a case study of the success of the adaptive management system to respond to non-scientific ways of thinking. Initiated by the Murray Darling Basin Commission, the Living Murray Indigenous Partnerships Project was heralded in 2004 by resource management agencies and the Yorta Yorta alike as a precedent for which the basis for future natural resource co-management in the Murray Darling Basin (and indeed more broadly) could be developed. Although those working in NRM agencies were optimistic about outcomes of this project, stasis in negotiations occurred. Institutional thinking diminished the effective representation of Yorta Yorta knowledge (as a non-positivist ontology), and was not adaptive to Indigenous concerns. Those working in NRM in the Barmah Forest case were not aware of how their positivist underpinnings (individually as well as reflected in institutional thinking) and how this was reflected in the way that the forest was managed. Case studies regarding co-management and adaptive co-management with Indigenous peoples from Canada and New Zealand offer suggestions for more integrative, responsive and flexible ways of including Indigenous knowledge (e.g. Berkes *et al.* 2003).

Stage 3: Ways forward for adaptive management: The importance of process and (re)conceptualising scale

Adaptive management literature emphasises the need for an effective and reflexive process of learning by doing. The importance of 'process', this paper argues, has its basis in managers' ability to understand and respect different forms of knowledge and to be able to *integrate* and respond to them in an appropriate and considered procedure for effective adaptive management. Understanding the appropriate process by which to include Indigenous knowledge and persons into the adaptive management framework requires first this basic appreciation of the differences in ontology between positivist (scientific) ways of thinking, and Indigenous ways of thinking. How is Indigenous (Yorta Yorta) knowledge different? How do we engage with different ontologies? Unlike positivist scientific thinking, Yorta Yorta ontology does not 'compartmentalise' or reduce environmental relationships to their simplest components for comprehension. Yorta Yorta thinking, like many other Indigenous knowledge systems, seeks to identify links and focus on relationships *between*

components of the environment in order to make sense of them; thus a more holistic way of integrating what positivism separates. When these ways of thinking come into contact with one another, basic building blocks of 'knowing' (see Howitt and Suchet-Pearson, 2006) cause tension. As explained above, a common outcome of this is communication breakdown and 'differences of language' offered as reasons for stalling of outcomes in projects. Including Yorta Yorta and Indigenous persons and knowledge in NRM management requires this understanding and recognition of this ontological pluralism, but also a realisation that NRM agencies often reinforce colonialist (and tokenistic) ways of interacting, albeit unintentionally. Recognising differences in the nature of knowledge (and the knowledge of nature) requires commitment to involving indigenous people on terms and with timeframes that are meaningful to them. By engaging with Indigenous groups on their own terms, the importance of respecting and understanding the advantages of Indigenous holistic ways of thinking and combining them with scientific understandings through co-management offer a much more adaptive way of managing resources, both in the social *and* biophysical arenas. Respecting these (and other) intercultural differences (note the 'environmental flow' example) goes a long way in respecting appropriate 'process' of inclusion into adaptive management.

(Re)conceptualising scale as a way of framing relationships also offers a way forward for adaptive management. If scale is conceptualised as a frame for not only spatial relations, but also used in understanding relations *between* environmental, cultural, political and economic dimensions (Howitt, 2007), complexity when including multiple ways of thinking becomes easier to comprehend. For example, adaptive management was initially developed as a landscape scale concept in predominantly ecological context (Walters & Hilborn, 1978). However, management agencies often attempt to use adaptive management at very localised scales of investigation (e.g. biological invertebrate investigations in 30cm x 30cm transects), and attempt to feed these 'findings' into the management project (often regional scale). Often adaptive management fails because it has been applied at the wrong scale, or misunderstood in its fundamental role when implemented as an integrator of social and biophysical dimensions, for responding iteratively (through interdisciplinary connectors) to issues in both spheres (also Biggs, 2003). This is where understanding the conceptual precursors to successful participatory adaptive management, one of these being inclusiveness, (also institutional flexibility etc) are so crucial for iterative learning across disciplinary divides. Another example of this misunderstanding of scale in applying adaptive management includes the attempted integration of Indigenous knowledge into an adaptive management framework with positivist underpinnings. In the Barmah Forest, Yorta Yorta knowledge is inherently place-based, meaning that the understandings cannot be separated from their *situated nature* on Country. In other words, Yorta Yorta knowledge and understanding is inseparable from its context in space but also time. In this way, Yorta Yorta understandings will always appear, to the positivist management agency, as *only relevant* local; however, what appears to the positivist as local may (and more often than not it does) relate to much broader scales. Without understanding how this place-based knowledge links in a holistic manner to scales above the local, and also linking with *relationships between* these scales, adaptive management will flounder when attempting to integrate Yorta Yorta ways of thinking (Howitt, 2001). Linking the scale concept to response to Indigenous concerns, and also returning to the original argument - without understanding the nature of knowledges that are to be integrated, management's capacity to respond to and represent Indigenous concerns will be severely restricted. When this occurs, this paper argues that management ceases to be adaptive.

Conclusion

Understanding institutional rigidity is an important first step to adaptive NRM. However, transcending internal issues, and beginning to overcome disciplinary barriers between scientific disciplines and including Indigenous knowledges requires a philosophical appreciation of the nature of knowledge. This paper suggests that reassessment of institutional, and also individual ways of thinking, needs to be reassessed if management is to be responsive, flexible and adaptive in cross-cultural settings. This involves efforts in understanding individual and institutional positions of understanding and re-examining how they reflect and promote particular ways of thinking through management procedures. Moving adaptive management forward requires appropriate process and links with scale to be considered in the steps articulated. The steps have been represented here as going from stage one to three, but in practice are not applied in a linear fashion. Iterative 'jumps' between steps (once again reflecting the complexity inherent to conceptualising these problems) are essential. In no way are the steps offered as a prescribed 'tick box' way of implementing adaptive management. They are suggested as starting points to (re)conceptualise and to offer a different perspective on the importance of including multiple knowledges in adaptive management. Adaptive

management frameworks are only as successful as they are flexible and inclusive, both through interdisciplinarity and cross-cultural engagement.

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References

- Allan, C., & Curtis, A. (2005). Nipped in the Bud: Why Regional Scale Adaptive Management Is Not Blooming. *Environmental Management* 36(3): 414-25.
- Berkes, F., Colding, J., & Folke, C. (2003). *Navigating Social-Ecological Systems: Building resilience for complexity and change*. Cambridge University Press, Cambridge, U.K.
- Biggs, H. C., & Rogers, K. H. (2003). 'An Adaptive System to Link Science, Monitoring and Management in Practice'. In: Biggs, H. C., Du Toit, J. T. & Rogers, K. H. (2003). *The Kruger Experience: Ecology and Management of Savanna Heterogeneity* Island Press.
- Brierley, G. J., & Fryirs, K. (2005). *Geomorphology and River Management: Applications of the River Styles Framework*. Victoria, Blackwell Publishing
- Castree, N. (2005). The epistemology of particulars: Human geography, case studies and ‘‘context’’. *Geoforum* 36(5): 541-544.
- Dovers, S. (2003). Processes and Institutions for Environmental Management: Why and How to Analyse. In: Dovers, S., Wild River, S. (eds) 2003. *Managing Australia's Environment*. Sydney, Australia. The Federation Press: 3-12.
- Howitt, R. (2001). *Rethinking Resource Management: Justice, Sustainability and Indigenous Peoples* Routledge, U.K.
- Howitt, R. (2005). The importance of process in social impact assessment: Ethics, methods and process for cross-cultural engagement. *Ethics, Place and Environment* 8(2): 209-221.
- Howitt, R. (2006). Scales of coexistence: tackling the tension between legal and cultural landscapes in post-Mabo Australia. *Macquarie Law Journal* 6: 49-64.
- Howitt, R., & Suchet-Pearson, S. (2006). Rethinking the Building Blocks: Ontological Pluralism and the Idea of 'Management' *Geografiska Annaler: Series B. Human Geography* 88 (3) p.323
- Jackson, S. 2005. Indigenous Values and Water Management: A Case Study from the Northern Territory. *Australasian Journal of Environmental Management* 12: 136-146.
- Lane, M. (2006). The role of planning in achieving Indigenous land justice and community goals. *Land Use Policy* 23(4): 385-394.
- McLain, R.J. & Lee, R.G. (1996). Adaptive Management: Promises and Pitfalls. *Environmental Management* 20 (4): 437-448.
- Maddock, I. (1999). The importance of physical habitat assessment for evaluating river health. *Freshwater Biology*, 41: 373-391
- MDBC (2005). Murray-Darling Basin Commission. The Barmah-Millewa Forest Asset Environmental Management Plan. MDBC Publication 31/05.
- MDBC (2006). and The Living Murray Website 2006. www.mdbc.gov.au.
- Rogers, K. (2003). Adopting a Heterogeneity Paradigm: Implications for Management of Protected Savannas. In: Du Toit, J.T., Rogers, K.H., & Biggs, H.C., (eds) *The Kruger Experience: Ecology and Management of Savanna Heterogeneity*. Washington, D.C: Island Press.: 41-58.
- Schumm, S. A., & Licity, R.W. (1965). Time, space & causality in geomorphology. *American Journal of Science* 263:110-119.
- Stankey, G. H., & Schinder, B. (1997). *Adaptive Management Areas: Achieving the Promise, Avoiding the Peril*. General Technical Report: Pacific Northwest research Station. United States Forest Service.
- Waite, G., Head, L., & Gill, N. (2006). Introduction: Applied Natures - cultural engagements with Australia environmental management. *Australian Geographer* 37(1): 1-3.
- Walker, B., S. Carpenter, J. Anderies, N. Abel, G. S. Cumming, M. Janssen, L. Lebel, J. Norberg, G. D. Peterson, and R. Pritchard. (2002). Resilience management in social-ecological systems: a working hypothesis for a participatory approach. *Conservation Ecology* 6(1): 14.
- Walters, C.J., & Hilborn, R. (1978). Ecological optimisation & adaptive management. *Annual Review of Ecology and Systematics*. 9: 157-188.
- Wilcock, D. (2006). Unpublished Honours Thesis. Dept. of Human Geography, Macquarie University.