

This article is downloaded from



<http://researchoutput.csu.edu.au>

It is the paper published as:

Author: Michael Mitchell

Title: From organisational learning to social learning: a tale of two organisations in the Murray-Darling Basin

Journal Title: Rural Society

ISSN: 1037-1656

Year: 2013

Volume: 22

Issue: 3

Pages: 230-241

Abstract: In this paper, I compare reflections from my action research engagements with two Murray–Darling Basin (MDB) natural resource management (NRM) organisations, Murrumbidgee Irrigation (MI) and Murray Catchment Management Authority (CMA) in NSW, Australia. My engagement with MI (2005–2007) coincided with the most extreme years of the extended Millennial Drought. The research engagement with Murray CMA (2009–2012) occurred as the Millennial Drought ended, and coincided with the 2010–2011 floods and local community anger over plans to reduce irrigation allocations in the MDB. Both organisations were also undergoing cultural change inspired by concerted efforts to promote widespread staff participation in evaluation, reflection and learning. While I observed considerable organisational learning at MI, staff recounted constraints on making substantial advances towards sustainable water use practices across the MDB because of limitations on MI’s sphere of influence. Murray CMA, on the other hand, was charged with the development of a ‘whole-of-community’ strategic plan. This required the development of organisational strategies that achieved both organisational change and the creation of opportunities for broader social learning. Murray CMA’s recognition of the importance of the social dimension is a critical element of the ‘double-loop’ learning that I argue enabled a transformation of the organisation’s culture.

URLs: <http://dx.doi.org/10.5172/rsj.2013.22.3.230>

http://researchoutput.csu.edu.au/R/-?func=dbin-jump-full&object_id=53538&local_base=GEN01-CSU01

CRO Number: 53538

FROM ORGANISATIONAL LEARNING TO SOCIAL LEARNING: A TALE OF TWO ORGANISATIONS IN THE MURRAY-DARLING BASIN

Michael Mitchell, School of Geography and Environmental Studies, University of Tasmania

This is a preprint version of a paper available at <http://dx.doi.org/10.5172/rsj.2013.22.3.230>

ABSTRACT

In this paper, I compare reflections from my action research engagements with two Murray-Darling Basin (MDB) natural resource management organisations, Murrumbidgee Irrigation (MI) and Murray Catchment Management Authority (CMA) in NSW, Australia. My engagement with MI (2005-2007) coincided with the most extreme years of the extended Millennium Drought. The research engagement with Murray CMA (2009-2012) occurred as the Millennium Drought ended, and coincided with the 2010-2011 floods and local community anger over plans to reduce irrigation allocations in the MDB. Both organisations were also undergoing cultural change inspired by concerted efforts to promote widespread staff participation in evaluation, reflection and learning. While I observed considerable organisational learning at MI, staff recounted constraints on making substantial advances towards sustainable water use practices across the MDB because of limitations on MI's sphere of influence. Murray CMA, on the other hand, was charged with the development of a 'whole-of-community' strategic plan. This required the development of organisational strategies that achieved both organisational change and the creation of opportunities for broader social learning. Murray CMA's recognition of the importance of the social dimension is a critical element of the 'double-loop' learning that I argue enabled a transformation of the organisation's culture.

KEYWORDS: triple-loop learning; transformation; governance; water resources management; sustainability

INTRODUCTION

Human use of natural resources has been on an unsustainable trajectory for far too long (Millennium Ecosystems Assessment, 2005), and this needs to change (Fischer, *et al.*, 2007). Our workplaces provide opportunities for the kinds of interactions needed to make advances towards a more sustainable future (Senge, Laur, Schley, & Smith, 2006). Yet it is too easy for organisations to remain driven by bottom line financial imperatives, ensuring our global society remains stuck on its unsustainable trajectory (Gray, 2006). Even the recent fervour for organisations to account for their performance against the triple bottom line seems to have had little impact on the pursuit of a more sustainable future (Milne, Tregidga, & Walton, 2009). This paper explores the experiences of two organisations, Murrumbidgee Irrigation (MI) and Murray Catchment Management Authority (CMA), which had been charged with natural resource management (NRM) responsibilities within the Murray-Darling Basin (MDB) of Australia. Both organisations sought to create a workplace environment where staff were encouraged to interact with each other to reflect on their organisation's purpose

and performance, at a time when much of broader society was demanding efforts to avert unsustainable water use in the MDB.

The reflective analysis presented in this paper focuses on a common thread that links the two organisations' experiences. That common thread is the link between the concepts and theory of organisational learning (Argyris & Schön, 1978) and social learning (e.g. Keen, Brown, & Dyball, 2005). Both case study investigations involved the use of organisational learning theory to assess the extent that organisational cultures had changed, and that critical assumptions had been challenged. It was clear that the pursuit by both organisations for greater sustainability in the use of natural resources required an extension of their organisational-scale learning experiences to society more broadly as they engaged with other organisations and individuals responsible for NRM. In Murray CMA's case, there was a clear realisation that to achieve their organisational purpose, their tasks were much more focused on people management than on managing the use of natural resources directly. Their organisational learning experience involved a challenge to the workplace cultural focus on the biophysical sciences, and the need to develop organisational skills and strategies to more effectively engage and build capacity of natural resource managers in the broader community. They adopted social learning as a key concept to pursue this agenda.

The contribution that this analysis provides revolves around the concept of 'triple-loop' learning (Tosey, Visser, & Saunders, 2012), which is associated with social learning (Keen, *et al.*, 2005), and the extent that this is qualitatively different from 'double-loop' learning, a key concept within organisational learning theory (Argyris & Schön, 1978). The paper begins with further explanation of these concepts, their origins and use, before introducing the research projects that form the basis for my analysis, and how they both evolved through the use of action research methods. I then present the two organisations' experiences as brief narratives and discuss my reflections in terms of the links between organisational learning and social learning.

BACKGROUND: FROM ORGANISATIONAL LEARNING TO SOCIAL LEARNING

Learning is necessary for sustainable development (Scott & Gough, 2004), which suggests that the achievement of sustainability involves an ongoing process of social change (Robinson, 2004). For researchers keen to practise their art in a way that might enhance sustainability, the recent 'learning turn' in the social sciences allows our engagements to be framed as interactions where all involved can learn – those doing the research, as well as those being researched (Bebbington, Brown, Frame, & Thomson, 2007). The research act can thus become a dialogue for critical reflection through which assumptions might get challenged, providing the potential for participants to be liberated from constrained ways of thinking, part of the foundations we need to transform our world (cf. Freire, 1972).

It is not surprising then to discover a heavy focus in the social sciences on theories about how to inspire such a critical and profound learning. Organisational learning theory provides several useful insights that practitioners can use (Senge, 1992). One key insight is the

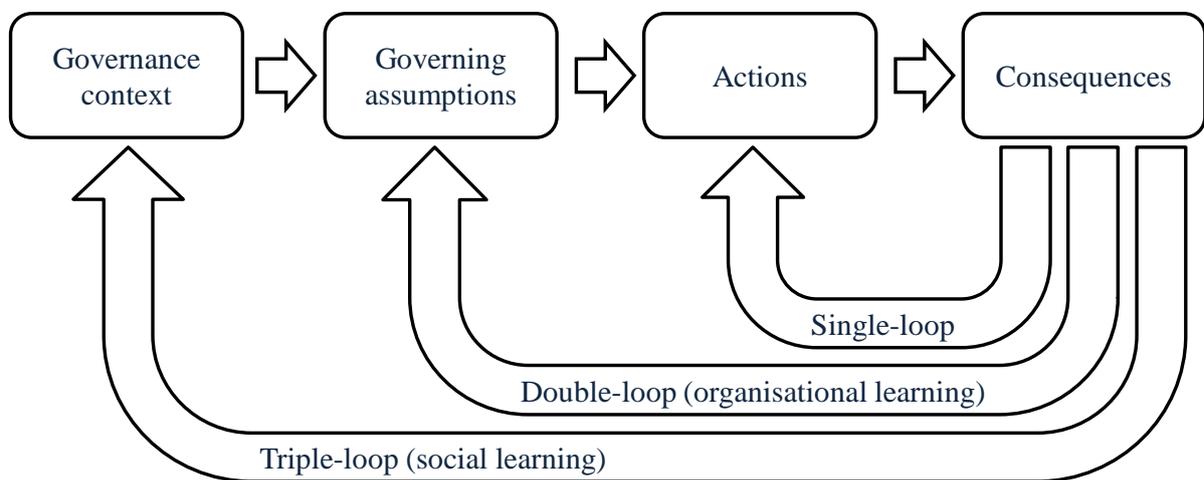
distinction between ‘single-loop’ and ‘double-loop’ learning. These were terms Argyris and Schön (1978) adopted from electrical engineering to denote two different levels of learning they had modified from Bateson’s (1972) categorisation. The illustration used for ‘single-loop’ learning is that of a thermostat ‘learning’ to detect errors in temperature and being able to rectify the situation by adjusting the cooling or heating mechanism accordingly. Such a process of ‘single-loop’ learning focuses on organisational actions and their consequences, and is governed, according to Argyris and Schön (1978), by ‘theories in use’ – operating assumptions that are often tacit within organisations. By contrast, ‘double-loop’ learning can develop when an organisation faces a critical situation that challenges their ‘theories in use’ – situations where error detection cannot be sufficiently corrected without first revealing, examining and revising the underlying assumptions that govern organisational practice. ‘Double-loop’ learning is therefore associated with strategic, proactive, generative and frame-breaking organisational behaviour rather than behaviours that are operational, reactive, adaptive and frame-taking (Roome & Wijen, 2006). The implication is that ‘double-loop’ learning can lead to organisational changes that are radical or transformational in character (Mitchell, Curtis, & Davidson, 2012).

Another key practical component of organisational learning theory is the need to build organisational capacity to ‘learn how to learn’. One component that helps to build this capacity is to nurture open and reflective interactions across the vertical and horizontal structures of the organisation, as though it were a level playing field. The rationale for such an approach is that these kinds of interactions can help to reveal tacit knowledge and assumptions within an organisation that have become blocks to ‘double-loop’ learning, blocks that are often unknowingly put in place by executives (Argyris, 1982). Creating open interaction requires support from those at the top, and can benefit from engaging outsiders, such as researchers, to facilitate free and fearless exchanges (Bebbington, *et al.*, 2007). Learning how to learn also implies knowing when ‘double-loop’ learning is required, or when problems can be effectively solved using ‘single-loop’ learning processes (Argyris, 1999).

The theoretical development around social learning has been much more diverse than that for organisational learning. Early work by Bandura (1977) focused on individual versus group learning, which he used to explore how human change agency can become collective agency (Bandura, 2000). However, the more common adoption of the ‘social learning’ concept has been associated with issues around sustainability and environmental management, issues that require action at scales beyond individuals and organisations (Keen, *et al.*, 2005). In this context, a social learning discourse has developed in tandem with the view that human interventions to improve the environment need to be understood in terms of the multiple interactive feedbacks that constitute complex and adaptive systems (Rodela, 2013). In particular, Pahl-Wostl and her colleagues have written extensively on the role that social learning can play in the complex multi-level governance contexts associated with water resources management in Europe (e.g. Pahl-Wostl, *et al.*, 2007) – as has Ison and his colleagues (e.g. Ison & Watson, 2007). Both link social learning with the potential and/or pathway for transformation. Pahl-Wostl (2009, p. 359) refers to this potential as transforming the governance context, i.e. transforming the context through which NRM decisions are

made: by whom, for whom, in whose interests, and for what purpose. She argues that this requires a third level of learning, adopting the term ‘triple-loop’ learning that she observed was becoming popular in management theory. The depiction she uses is similar to that used by Keen *et al.* (2005, p. 17), and a modified version of these depictions appears as Figure 1.

In Pahl-Wostl’s (2009, p. 359) version, ‘single-loop’ learning is described as involving “incremental improvements in established routines”; ‘double-loop’ learning involves reframing because it calls into question underlying assumptions, and ‘triple-loop’ learning focuses attention on the governance context, and is thus transforming. However, transformation can occur at different scales. Organisations can also be transformed, and such organisational-scale transformations are more easily achievable than are transformations of broader societal-scale governance structures within which organisations function. So, I argue the distinction is one of scale rather than the character of the change. I suggest that it involves a shift from learning at an organisational scale to learning that takes place at a social scale, as shown in Figure 1.



Source: modified from Keen *et al.* (2005, p. 17) and Pahl-Wostl (2009, p. 359).

Figure 1: Re-evaluating the meaning behind ‘triple-loop’ learning

Social learning that helps society at large question the governance context – or “governing values” as used by Keen *et al.* (2005, p. 17) – is difficult. Most of the literature that refers to processes of social learning does not provide evidence that this has been achieved. For this reason, and in response to Pahl-Wostl *et al.*’s (2007) and Ison & Watson’s (2007) work amongst others, Reed *et al.* (2010) have warned against loose use of the ‘social learning’ term. In particular, they assert that social learning involves more than just learning in a group made up of diverse and multiple stakeholders. For social learning to be effective, they assert that “the ideas and attitudes learned by members of the small group must diffuse to members of the wider social units or communities of practice to which they belong” (Reed, *et al.*, 2010, p. 4). Workplace activists can have an important role here (Ball, 2007; Mitchell, *et al.*, 2012). They can use processes that enable profound learning within organisations to pursue the agenda of external activists, whose radical agenda for change they share, albeit “tempered” by the constraints of their employment (Meyerson & Scully, 1995).

RESEARCH METHODS AND CONTEXTS

This paper is a reflective account of two separate research projects. Both involved active researcher engagement driven by a desire to influence outcomes on the ground for the organisations involved. This approach to research has been described as action research (Greenwood & Levin, 2007), and is advocated by organisational learning theorists (Schön, 1995). The leadership of both organisations actively supported the research projects as they were keen to benefit from the research interactions and outcomes. Part of the funds for the research with Murray CMA was provided by the organisation.

Researchers adopting an action research approach need to be wary of managerial capture (Adams & Larrinaga-González, 2007), and this necessitates independent and critical researcher reflection (Kemmis & McTaggart, 2005). However, action research can also create the opportunity for a “reflective transfer” of ideas as organisational practitioners reflect on how they have applied the concepts acquired through their engagement with the research project (Schön, 1995, p. 24). For researchers, this greatly advances the research agenda, as the development of knowledge requires the social interaction involved in putting ideas into action (Sayer, 1992).

MI is a former government department that was privatised in the 1990s and manages the Murrumbidgee Irrigation Area (MIA) in central New South Wales (NSW), Australia. It is an unlisted company with around 200 employees whose shareholders comprise its customers. Murray CMA is a NSW statutory authority created to deliver NRM funding and programs at the regional sub-catchment scale. The organisation employs about 50 staff, of whom over two-thirds are engaged on temporary contracts. Murray CMA is one of 56 regional NRM bodies created across Australia to facilitate devolved governance (Lockwood, Davidson, Curtis, Stratford, & Griffith, 2009), although recent NSW government restructuring announced in October 2012 will reduce this number to 54, and will involve a change in name and an increase in Murray CMA’s areas of responsibility. The performance of NSW-based CMAs is monitored by the NSW Natural Resources Commission (NRC), an independent body established to advise the NSW government on the functioning of the NRM system (Natural Resources Commission, 2005).

The character of the organisational changes observed at MI and Murray CMA built from an analysis of qualitative data created through my observations as an active participant in the process of change, and semi-structured interviews conducted with other participants. Interviews were conducted on the guarantee that confidentiality of individuals was ensured, but an assurance of organisational anonymity was not required or sought by either organisation. Approval to use quotes that may be identified to a specific person within an organisation was obtained from the person involved. Selection of interviewees was determined through a ‘purposeful’ approach (Patton, 2002) focused on those most actively involved in the two activities that were the focus of the research engagement – the improvement in triple bottom line (TBL) reporting at MI and the review of the strategic plan at Murray CMA. As a result, the interviews involved more than just data creation; they were an opportunity for participants to engage in reflective interaction about the activities they

were engaged in and the nature of the changes that were occurring. Thematic analysis was used to identify from the transcribed interview data those comments that addressed predetermined themes relating to key research questions and to identify additional emergent themes.

The results of the research with MI have already been published (Mitchell, *et al.*, 2012). This paper provides the first opportunity to publish findings from the research with Murray CMA. Results from the research with MI raised questions about the challenges of pursuing sustainability at organisational scales that needed further research to address. I then had the opportunity to explore these questions through the research project with Murray CMA. There is therefore much greater focus in this paper on documenting the outcomes of the project with Murray CMA, including the extent they help address the challenges raised as a result of the research investigations with MI.

The focus of my engagement with MI was its use of triple bottom line (TBL) reporting. I used organisational learning theory to analyse the extent that MI's TBL reporting process made any difference in enhancing sustainability outcomes. The research engagement with Murray CMA was part of a larger *Transformation for Resilient Landscapes and Communities* project, and the findings presented here relate to the final stages of my involvement in that project. The project had introduced resilience thinking (Walker & Salt, 2006), collective learning (Brown, 2008) and adaptive governance (Folke, Hahn, Olsson, & Norberg, 2005) concepts to Murray CMA, who had applied their understanding of these concepts as part of radical overhaul of their approach to engaging stakeholders in strategic planning. My analysis has been provided to Murray CMA as an unpublished report, and is based on participant observation notes developed in 2011-2012 and recorded interview discussions with ten key participants in June 2012.

FINDINGS: A TALE OF TWO ORGANISATIONS

Murrumbidgee Irrigation

The executive team at MI supported my engagement with staff in the organisation as we collaborated on a project to enhance the potential for TBL reporting to make a positive difference for the organisation. They were keen to support the participation of staff from middle management positions upwards in workshop processes that facilitated an open and frank exchange on how to improve their reporting, and what was being learned as a result. This included a workshop that evaluated their TBL reporting process against criteria identified from the literature (Mitchell, Curtis, & Davidson, 2008), and a workshop towards the end of my engagement based on my critical assessment of their reporting process. There was clear evidence of MI's preparedness to open up interactive spaces to encourage dialogue, and to enable those participants to 'learn how to learn' (Mitchell, *et al.*, 2012).

However, there was little evidence of participants being able to substantially question the organisation's assumptions about the sustainability of its core activities. Interviewees provided examples of some minor gains to reduce unnecessary water escapes from irrigation channels and improved storage to reduce evaporation. The broader issue of how to enhance

the sustainability of water use across the MDB as a whole was observed as being a matter that was beyond one organisation to achieve. As one MI interviewee explained, if MI was able to collaborate with other organisations in the MDB, “obviously it’s just common sense that you will have far greater opportunities to impact those big issues” (interview with MI staff member, March 2007). Similar comments by others also pointed to the limitations of MI’s sphere of influence, and considerable interest in the idea of expanding the TBL reporting project to involve other organisations in the region. From this I concluded that my work at the organisational scale would have been more effective if it was part of a broader multi-stakeholder TBL reporting project that used the same principles underpinning organisational learning theory, but expanded to encompass multiple organisations and the community, as an exercise in social learning. I expected that the interactions such a project would create could lead to a re-examination of the governance arrangements underpinning how water allocations are determined for different purposes in the MDB.

The research findings from the MI case study raised profound questions about how to achieve enhanced sustainability and improved NRM outcomes through multi-organisational collaboration. This was beyond the scope of that research project to address, and I sought an opportunity to explore how to put such a social learning research agenda into practice. Such an opportunity arose through the research agenda of the *Transformation for Resilient Landscapes and Communities* project, involving the Murray CMA.

Murray CMA

The *Transformation for Resilient Landscapes and Communities* project commenced in 2009 to explore the idea of transformational change as an option for rural, resource-dependent communities. In particular, we sought to identify attributes and influences that might provide communities with the extra capacity needed to instigate deep systemic change when circumstances demand transformative action and incremental adjustment is insufficient to meet that challenge. The project commenced with a case study involving Murray CMA working with a particular rural community and associated local government council (Mitchell, *et al.* in press), but then evolved into a project centred around Murray CMA’s review of its own strategic plan, known as the Catchment Action Plan (CAP). A consistent theme throughout the project was the pursuit of social learning through effective community engagement processes drawing on attributes that might inspire deep systemic change.

At the organisational scale, our engagement with Murray CMA developed through a pivotal period for the organisation. Murray CMA’s interest in embarking on a partnership with us followed a poor performance audit from the NRC, which was then followed by a turnover of the majority of its management Board of stakeholder appointees, who appointed a new Chair. A new General Manager (GM) was then appointed from among Murray CMA’s existing staff. The new Chair established a practice of having every alternate monthly Board meeting an open discussion with senior staff about Murray CMA’s strategic directions, thus separating the formal business-like Board meetings from those that invited interaction and discussion at a strategic level (interview with Murray CMA Board member, June 2012). A similar degree of open discussion on Murray CMA’s strategic directions was also encouraged

among the staff by the new GM. Indeed, several staff interviewed credited the new GM, his leadership style and “open door policy” for instigating a “transformation” in how the organisation functioned (interview with Murray CMA staff member, June 2012).

One staff member described the newly transformed organisational culture as “more professional ... we learnt to be leaders in ourselves ... our business isn’t just about the service we provide to the community, it is the service we provide to each other ... we do quality work and where possible we contribute to setting a precedent if we can” (interview with Murray CMA staff member, June 2012). Previously the organisational culture revolved around delivering projects to stakeholders with very little prioritisation or planning (interview with Murray CMA Board member, June 2012). Another staff member emphasised the degree of trust imparted to staff by management, associated with a devolvement of responsibility. The “previous regime” had maintained tight control over planning and budgets, whereas now there was top-level commitment to “creating a culture of empowerment ... getting staff to make decisions” (interview with Murray CMA staff member, June 2012). This top-level commitment was reinforced with a recognition that organisational restructuring was required to free up and refocus staff time towards new responsibilities they needed to take on board – and if they ever felt they were being “pushed too hard”, they could “push back” (interview with Murray CMA staff member, June 2012).

The organisational restructuring was undertaken so that a certain number of staff were able to dedicate most of their time to facilitating a thorough review of their strategic plan, the CAP. Two other CMAs had undertaken pilot upgrades of their CAPs drawing on resilience thinking (Natural Resources Commission, 2011a, 2011b), and the NRC was encouraging other CMAs to see if that thinking could benefit their pending upgrades (Natural Resources Commission, 2011c). In this context, Murray CMA was well-placed to take advantage of the changes inspired by its engagement with the *Transformation for Resilient Landscapes and Communities* project team. As its GM explains, Murray CMA’s adoption and application of concepts associated with resilience thinking, collective learning and adaptive governance had helped spearhead profound changes for the organisation:

“Firstly I’d like to acknowledge that there have been some profound changes, and to a very large extent they’ve originated through the contacts with the researchers in this project who have introduced me, my staff and the Board to a range of concepts that were at first unfamiliar and quite frightening. It took a period of time for us to become familiar with the terminology. It took a longer period of time for us to become familiar and comfortable with the meaning behind the terminology, and it took an even longer period of time – and we’re still working on it – to work out how to apply the theory into practice, and how to communicate the concepts in ways to community stakeholders that will potentially fast-track their learning process as well” (interview with Murray CMA GM, June 2012).

The GM devolved responsibility for the CAP upgrade to a dedicated team within Murray CMA, and restructured the organisation accordingly. An even braver devolvement of responsibility was orchestrated by Murray CMA's Board, who appointed an independent committee of community stakeholders to take responsibility for overseeing the CAP upgrade. Both these actions represented a radical shift from Murray CMA's past practices, and were out of step with how other CMAs were executing their CAP upgrades. In addition, Murray CMA recognised that they needed to build their social research capacity to be able to execute their plans more effectively, and therefore appointed a Socio-Economics Project Officer in early 2011 followed by a higher-level Social NRM Catchment Officer in early 2012. This appears to be the first time a CMA has created positions dedicated to social research.

Because these developments appeared to represent a transformation of organisational culture and practices, I was curious to understand the learning processes that culminated in these changes. As part of the interviews, I sought to establish if any of my interviews could identify any "light-bulb" experiences that might represent particular moments in time when pre-existing organisational assumptions had been overturned. Most could not identify such a moment, and this response was indicative: "I have light bulb moments, but I can't recall them. I mean I can't recall them to tell you now. No, I mean a lot of what I do is just really about continual improvement" (interview with Murray CMA Board member, June 2012). These responses led me to conclude that transformations of social systems like an organisation do not necessarily involve the crossing of a threshold or tipping point (Gladwell, 2000). Transformations involving social relations and feedbacks are usually evolutionary processes, where the end result is radically different from the starting point. This is a helpful conclusion for activists who may get frustrated with the pace of change. What might appear as "small wins" can develop into a more substantial change, given that "several small changes in the aggregate can approximate those of a radical transformation", especially where the changes are "moving in a similar direction" (Weick & Westley, 1996, p. 445).

The perception that Murray CMA had undergone a transformation was also held by external stakeholders. Two of my interviewees were members of the afore-mentioned community-based committee responsible for overseeing the CAP upgrade. I had been advised that both had previously been critics of Murray CMA, a perception quickly confirmed by both interviewees. From their point of view, the major change had been Murray CMA's approach to engaging its stakeholders. Previously, most rural landholders and the broader community in the area had been widely disillusioned with Murray CMA for its "very introspective attitude and thinking" and for "totally disregarding" input from its advisory committees, whereas the CMA's current commitment to "take notice of the community" had resulted in a "transformation" in "the integrity of the CMA from the community's point of view" (interview with community-based CAP upgrade committee member, June 2012). The other committee member interviewed, a rural land manager, emphasised that Murray CMA staff were "starting to believe that they've got to take all of the land managers with them – they might even have to put the land managers up front, and find out exactly how they see things" (interview with community-based CAP upgrade committee member, June 2012).

These views fit with the more general view that Murray CMA's transformation was all about "putting people first" (interview with Murray CMA staff member, June 2012).

"I think we are starting to understand what our business really should be about, and that's about connecting community and place – an emphasis on people, connecting them into the landscape and delivering opportunities for people to function sustainably within their landscape ... to actually manage the human element of everything that we do" (interview with Murray CMA Board member, June 2012).

This new operating assumption was presented in contrast to that previously held, which had involved remaining "focused on the environmental or bio-physical component of natural resource management" (interview with Murray CMA staff member, June 2012). The new business ethos for Murray CMA to focus on social aspects of NRM over the bio-physical was such a profound shift consistently mentioned by my interviewees that it clearly represented an example of organisational transformation borne out of 'double-loop' learning. The assumption driving organisational behaviour had shifted, leading to new benchmarks upon which the organisation judged its performance.

The new challenge for Murray CMA was whether it could deliver on its task to develop a "whole-of-community" and "whole-of-government" strategic plan for the region. That is, the intention of the CAP is to facilitate regional collaboration on NRM involving the whole of the catchment community, and all the sections and agencies of multi-layered government responsible for NRM in the region. From my prior research experience with MI, this seemed to be exactly the kind of approach needed for achieving deep systemic change.

Some interviewees expressed concern that a conflict might arise between a CAP built on "community aspirations" and the need for it to also meet government regulations related to bio-physical requirements, such as requirements to protect threatened species. Two strategies were mentioned by one interviewee to help manage this risk. The first strategy was to ensure that "whole-of-community" engagement in the planning process also involved government agency representatives, as they should be perceived as being part of the community, not separate from it. The second was to ensure that there was "such a high level of community support and buy-in" for the CAP that government ministers responsible for their portfolios would be able to "weigh up the benefits of having community buy-in and ownership of the catchment planning process" against any concerns that "statutory requirements haven't been fully met by the CAP" (interview with Murray CMA staff member, June 2012). Both strategies evolved from an appreciation of 'adaptive governance' – described as being about "how decisions are made" as part of a process of "governing for change". The strategies suggest that the organisation is beginning to move beyond the 'double-loop' learning involving a re-evaluation of its governing assumptions towards what might be called 'triple-loop' learning, involving a re-evaluation and potential shake up of the governance context within which the organisation functions.

DISCUSSION

A number of threads tie the experiences of these two organisations. The first is that both organisations sought to create organisational change by providing spaces for interaction – spaces designed to cut across the vertical and horizontal structures of the organisations. Admittedly, these efforts did not extend below those in middle management positions, but they certainly sought to break down the barrier between Board and executive as those who traditionally set the strategic direction for the organisation, and those in middle management positions responsible for leading the operationalising of that strategic direction. The effect of the opening up of these spaces for interaction was the potential for profound learning and the opportunity to develop individual and collective change agency. When these organisational actions are aligned with research projects, researchers are in the privileged position of facilitating an open and fearless exchange, which can further strengthen the potential for ‘double-loop’ learning to eventuate (Bebbington, *et al.*, 2007).

Both organisations undertook these actions against the backdrop of a broader societal debate about the sustainability of water use in the MDB. In MI’s case, it was clear that this debate involved a broader governance context that was beyond one organisation to influence. The view was put that collaboration with other organisations would be needed if MI was to have an effective influence on such a broad issue facing the MDB. By contrast, Murray CMA’s transformation in its underlying ethos and approach occurred soon after a spectacular debacle in how the Murray-Darling Basin Authority had sought to engage the MDB communities in the development of its draft plan for the reduction of irrigation allocations across the Basin (Connell & Grafton, 2011). The Authority was accused of consulting with communities too late in the process, receiving angry responses when they did eventually consult the communities, including a much publicised event when copies of the Authority’s draft plan were burnt. Murray CMA sought to adopt a different approach, which was the rationale given for the Board’s bold decision to devolve responsibility for its CAP upgrade to a community-based committee (interview with Murray CMA staff member, June 2012). Murray CMA also had a mandate to be the organisation to spearhead the whole-of-community and whole-of-government collaboration that would be needed to address the complex NRM issues they faced, including sustainable water use in the MDB.

To create the space for such collaboration and dialogue, Murray CMA and its community-based committee promoted an engagement process that built on social learning principles. That is, they facilitated the creation of spaces for interaction that could span social structures, in a similar way to how spaces are created in organisations that span internal organisational divisions. The place-based discussion groups created as part of the community engagement process for Murray CMA’s CAP were also built on an appreciation that there are multiple ways in which different people in society construct knowledge (Brown, 2010). So, while the principles that facilitate organisational and social learning are the same, the process and outcome of profound learning is only different in terms of scale – from organisational to social. Profound social learning that uncovers the constraints of a prevailing governance context is much more difficult to achieve than the kind of learning that leads an organisation to rethink its governing assumptions. The former could be termed ‘triple-loop’ learning, but if

so, the difference from ‘double-loop’ learning is not about the quality or level of the learning experience, but rather one of scale.

CONCLUSION

The organisational learning experiences of both MI and Murray CMA led to a recognition that challenging the governing assumptions of their organisations was intrinsically linked to the need to explore and challenge the governance context within which the organisations were operating. I would suggest that this would be a common experience. Organisations able to challenge their own governing assumptions are likely to also recognise that the broader social system and its governance arrangements also need to be challenged if societies at large are to start moving away from the unsustainable trajectories they are on. For these two organisations, a key focus was how to create a water resource management system in the Murray-Darling Basin that enhanced the sustainability of water use. This pursuit not only helped to challenge governing assumptions, but also the governance context. New strategies were needed to address both.

There is clearly a big difference between the creation of strategies that help to address organisational assumptions about how to make water use more sustainable and strategies that address the governance context preventing organisations from making a difference in terms of water use management. This difference has sparked theorists to distinguish between these as two levels of learning, but in my view they are intrinsically interlinked. As concepts ‘double-loop’ and ‘triple-loop’ learning are qualitatively different to ‘single-loop’ learning, and this is a necessary and helpful distinction. There is more to learning than reflecting on consequences of actions, as we need to always be able to question why we do the things we do. However, the distinction between ‘double-loop’ and ‘triple-loop’ learning is not really one that involves a different quality or level of learning. The concept of ‘triple-loop’ learning is a mere extension of ‘double-loop’ learning that prompts those involved – if that prompt was ever necessary – to identify strategies to advance their organisational change strategies into ones that can influence social change and action. If our efforts to achieve change do not go beyond our organisations and influence broader society, we are unlikely to be able to prevent ourselves from hurtling down the unsustainable trajectory on which we are currently travelling.

Further research is needed. Murray CMA has been able to put into practice some of the ideas and strategies acquired through their involvement with the *Transformation for Resilient Landscapes and Communities* project, and, as researchers we can learn from their efforts and outcomes. That project continues to identify the attributes and influences that provide the extra capacity needed to achieve transformational change at broader societal scales, and further work is needed to test these ideas by working with other NRM practitioners in other multi-organisational contexts. There are many NRM practitioners across Australia who appreciate the need for deep systemic change, and they are forming a community of practice to share ideas and strategies together with researchers from the project. In particular, what is needed is not just radical innovations in process, but also radical innovations in NRM practice to achieve more sustainable outcomes. It is also not yet clear whether the capacities

required for deliberate transformations are qualitatively different from those that facilitate adaptation (O'Brien, 2012; Marshall, Park, Adger, Brown, & Howden, 2012). The potential impacts on the viability of existing agricultural practices in particular places continues to put pressure on the need to improve our understanding of what is required to achieve deliberate transformational change (Rickards & Howden, 2012; Park, *et al.*, 2012).

For Murray CMA, however, the current round of restructuring by the NSW government is imposing another radical overhaul of the organisation's identity and structure, and the loss of staff, including some of the key workplace activists I interviewed. These developments accentuate a distinction between the outcomes of transformations when they are imposed externally from those rare internally inspired transformations, like that at Murray CMA, driven by a fundamental shift in collective thinking among those creating the transformation. From the analysis presented in this paper, such internally inspired transformations necessarily involve 'double-loop' learning, and could perhaps extend to 'triple-loop' learning. However, further research is needed to identify the kinds of strategies and tools that can be of use to organisations and communities who are going through an imposed transformation, and how these capacities differ from those required for adaptation and/or deliberate transformation. For Murray CMA, the challenge might involve developing strategies to continue pursuing the positive developments to date in spite of the additional restructuring and loss of personnel, or perhaps the situation may require the identification of entirely new capacities, strategies and goals (cf. O'Brien, 2012). Either way, it will be important to monitor how those who remain in the organisation continue to put adaptive governance ideas and principles into practice as the organisation restructures to absorb new responsibilities, personnel, interactions and alliances. In other contexts, the question might be how to facilitate profound learning in spite of the imposed change.

ACKNOWLEDGEMENTS

This paper was written as part of a post-doctoral research fellowship provided by the National Environment Research Program's Landscape and Policy Hub. My deepest appreciation goes to the Boards and staff of Murrumbidgee Irrigation and Murray CMA for their time, as well as their support and interest in the research upon which this paper is based. The research with MI was funded by a grant from the CRC for Irrigation Futures, and the research with Murray CMA was funded through grants provided by Murray CMA, Natural Resources Commission, the National Centre for Groundwater Research and Training through the keen support of Prof Allan Curtis, and the Rural Industries Research and Development Corporation. I would like to give special credit to Rod Griffith, Paul Ryan, Greg Walkerden and other members of the *Transformation for Resilient Landscapes and Communities* project team who supported my involvement with Murray CMA and significantly helped to shape the analysis presented in this paper. Finally, thanks to the two anonymous reviewers whose comments helped improve the paper significantly.

REFERENCES

- Adams, C. A., & Larrinaga-González, C. (2007). Engaging with organisations in pursuit of improved sustainability accounting and performance. *Accounting, Auditing and Accountability Journal*, 20(3), 333-355.
- Argyris, C. (1982). The executive mind and double-loop learning. *Organizational Dynamics*, 11(2), 5-22.
- Argyris, C. (1999). *On organizational learning* (2nd ed.). Oxford: Blackwell Business.
- Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective*. Reading, MA: Addison-Wesley.
- Ball, A. (2007). Environmental accounting as workplace activism. *Critical Perspectives on Accounting*, 18(7), 759-778.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs NJ: Prentice-Hall.
- Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science*, 9(3), 75-78.
- Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballantine Books.
- Bebbington, J., Brown, J., Frame, B., & Thomson, I. (2007). Theorizing engagement: The potential of a dialogic approach. *Accounting, Auditing and Accountability Journal*, 20(3), 356-381.
- Brown, V. A. (2008). *Leonardo's vision: A guide to collective thinking and action*. Rotterdam: Sense.
- Brown, V. A. (2010). Collective inquiry and its wicked problems. In V. A. Brown, J. A. Harris & J. Y. Russell (Eds.), *Tackling wicked problems through the transdisciplinary imagination* (pp. 61-83). London: Earthscan.
- Connell, D., & Grafton, R. Q. (Eds.). (2011). *Basin futures: Water reform in the Murray-Darling Basin*. Canberra: ANU e-press.
- Fischer, J., Manning, A. D., Steffen, W., Rose, D. B., Daniell, K., Felton, A., et al. (2007). Mind the sustainability gap. *Trends in Ecology and Evolution*, 22(12), 621-624.
- Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources*, 30(1), 441-473.
- Freire, P. (1972). *Pedagogy of the oppressed*. Hammondsworth: Penguin.
- Gladwell, M. (2000). *The tipping point: How little things can make a big difference*. London: Abacus.
- Gray, R. (2006). Does sustainability reporting improve corporate behaviour? Wrong question? Right time? *Accounting and Business Research*, 36(Special issue), 65-88.
- Greenwood, D. J., & Levin, M. (2007). *Introduction to action research: Social research for social change* (2nd ed.). Thousand Oaks, CA: Sage.
- Ison, R., & Watson, D. (2007). Illuminating the possibilities for social learning in the management of Scotland's water. *Ecology and Society*, 12(1), 21.
- Keen, M., Brown, V. A., & Dyball, R. (Eds.). (2005). *Social learning in environmental management: Towards a sustainable future*. London: Earthscan.
- Kemmis, S., & McTaggart, R. (2005). Participatory action research: Communicative action and the public sphere. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (3rd ed., pp. 559-603). Thousand Oaks, CA: Sage.
- Lockwood, M., Davidson, J., Curtis, A., Stratford, E., & Griffith, R. (2009). Multi-level environmental governance: Lessons from Australian natural resource management. *Australian Geographer*, 40(2), 169-186.
- Marshall, N. A., Park, S. E., Adger, N. W., Brown, K., & Howden, S. M. (2012). Transformational capacity and the influence of place and identity. *Environmental Research Letters*, 7(3), 034022.

- Meyerson, D., & Scully, M. A. (1995). Tempered radicalism and the politics of ambivalence and change. *Organization Science*, 6(5), 585-600.
- Millennium Ecosystems Assessment (2005). *Ecosystems and human well-being: Synthesis*. Washington, DC: Island Press.
- Milne, M. J., Tregidga, H., & Walton, S. (2009). Words not actions! The ideological role of sustainable development reporting. *Accounting, Auditing and Accountability Journal*, 22(8), 1211-1257.
- Mitchell, M., Curtis, A., & Davidson, P. (2008). Evaluating the process of triple bottom line reporting: Increasing the potential for change. *Local Environment*, 13(2), 67-80.
- Mitchell, M., Curtis, A., & Davidson, P. (2012). Can triple bottom line reporting become a cycle for “double loop” learning and radical change? *Accounting, Auditing and Accountability Journal*, 25(6), 1048-1068.
- Mitchell, M., Griffith, R., Ryan, P., Walkerden, G., Walker, B., Brown, V., et al. (in press). Applying resilience thinking to natural resource management through a “planning-by-doing” framework. *Society and Natural Resources*.
- Natural Resources Commission (2005). *Standard for quality natural resource management*. Sydney: NSW Natural Resources Commission.
- Natural Resources Commission (2011a). *Example of NRC’s report format based on the Central West pilot upgraded CAP* (Document No. D11/0874). Sydney: Natural Resources Commission.
- Natural Resources Commission (2011b). *Example of NRC’s report format based on the Namoi pilot upgraded CAP* (Document No. D11/0228). Sydney: Natural Resources Commission.
- Natural Resources Commission (2011c). *Framework for assessing and recommending upgraded catchment action plans* (Document No. D10/0769). Sydney: Natural Resources Commission.
- O'Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography*, 36(5), 667–676.
- Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, 19(3), 354-365.
- Pahl-Wostl, C., Craps, M., Dewulf, A., Mostert, E., Tàbara, D., & Taillieu, T. (2007). Social learning and water resources management. *Ecology and Society*, 12(2), 5.
- Park, S. E., Marshall, N. A., Jakku, E., Dowd, A. M., Howden, S. M., Mendham, E., et al. (2012). Informing adaptation responses to climate change through theories of transformation. *Global Environmental Change*, 22(1), 115-126.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Reed, M. S., Evely, A. C., Cundill, G., Fazey, I., Glass, J., Laing, A., et al. (2010). What is social learning? *Ecology and Society*, 5(4), r1.
- Rickards, L., & Howden, S. M. (2012). Transformational adaptation: Agriculture and climate change. *Crop and Pasture Science*, 63(3), 240-250.
- Robinson, J. (2004). Squaring the circle? Some thoughts on the idea of sustainable development. *Ecological Economics*, 48(4), 369-384.
- Rodela, R. (2013). The social learning discourse: Trends, themes and interdisciplinary influences in current research. *Environmental Science and Policy*, 25, 157-166.
- Roome, N., & Wijen, F. (2006). Stakeholder power and organizational learning in corporate environmental management. *Organization Studies*, 27(2), 235-263.
- Sayer, A. (1992). *Method in social science: A realist approach*. London: Routledge.

- Schön, D. A. (1995). Knowing-in-action: The new scholarship requires a new epistemology. *Change*, 27(6), 26-34.
- Scott, W., & Gough, S. (2004). *Key issues in sustainable development and learning: A critical review*. London: Routledge.
- Senge, P. M. (1992). *The fifth discipline: The art and practice of the learning organisation*. Sydney: Random House.
- Senge, P. M., Laur, J., Schley, S., & Smith, B. (2006). *Learning for sustainability*. Cambridge, MA: SoL (Society for Organizational Learning).
- Tosey, P., Visser, M., & Saunders, M. N. K. (2012). The origins and conceptualizations of 'triple-loop' learning: A critical review. *Management Learning*, 43(3), 291-307.
- Walker, B. H., & Salt, D. (2006). *Resilience thinking: Sustaining ecosystems and people in a changing world*. Washington, DC: Island Press.
- Weick, K. E., & Westley, F. (1996). Organizational learning: Affirming an oxymoron. In S. R. Clegg, C. Hardy & W. R. Nord (Eds.), *Handbook of organization studies* (pp. 440-458). London: Sage.