ORGANIZING FOR ECOLOGICAL REPAIR: RECONSTRUCTING LAND MANAGEMENT PRACTICE

Abstract

In this paper we explore organizing narratives that underpin the generation of effective ecological solutions. We examine the processes of meaning construction in relation to the development of sustainable land management practices in the Landcare organization in Australia. Meaning construction is situated in a variety of contexts that are themselves strongly influenced by a meta-narrative, which Taylor (2004) has labelled the 'modern social imaginary': a shared system of meanings that captures the imaginations of individuals and shapes their social groupings and society. The shift in meaning construction is reflected in the emergence of a narrative of 'ecological repair' that involved a process of learning and knowledge development we have labelled protracted sense making. Our research findings have led us to conclude that the development of successful ecological solutions require an active rewriting of the social imaginary.

Keywords: learning and change, meaning system, meta-narratives, sense-making, social imaginary, sustainability

Organizing for ecological repair: reconstructing land management practice

Recent interorganizational and intergovernmental reports seem to reflect growing awareness of the dependence of organizations upon natural systems and heightened interest in environmentally responsible actions that facilitate change for ecological sustainability (The Economics of Ecosystems and Biodiversity in Business and Enterprise (TEEB) Coalition, 2013; World Forum for Natural Capital, 2013). Ecological sustainability problems such as water crises, and the failure of climate change adaptation are rated by the World Economic Forum in the top five global risks in terms of impact for 2015 (World Economic Forum, 2015) yet many organizations appear to still not engage with sustainability in day to day activities (Global Corporate Sustainability Report, 2013; Walker & Brammer, 2009). This disparity between espoused and actual commitments by organizations to act in ecologically sustainable ways prompted our research: Why do organizations seem to resist changes needed to take up ecologically responsible practices?

Through a study of the Landcare Network, an Australia wide organization established to promote sustainable agricultural practices through local and regional project based structures, we address organizational responses to sustainability issues. The Landcare network in Australia was selected as a case for study because it is an organization whose specific purpose was to bring about change for ecological sustainability.

We draw from the theory of narrative inquiry (e.g. Clandinin & Rosiek, 2007; Gill, 2001), investigating implicit meaning construction and explicit processes of knowledge acquisition in the generation and enactment of effective ecological solutions. Our starting point is that farmers within Landcare, as with organizations and organizational members more generally, are situated within 'meaning systems' that are represented by socially endorsed narrative constructions of reality (Bruner, 1991). We argue our research shows these 'meaning systems'

coevolve (Benn and Baker, 2009) with changes to their contextual environment enabled by a variety of knowledge acquisition processes shaped by protracted sense-making.

Our research adds to the investigations on change for ecological sustainability and contributes to a wider understanding of how alterations to meta-narratives constituting 'meaning systems' lead to organizational and societal learning and change. In exploring the interaction between our tacit, everyday experience of the natural environment and the constructed meaning we assign to that environment, this paper contributes to the growing body of work examining the relationship between organizations and nature (e.g. Crane, 2000; Livesey, 2001; Preuss & Dawson, 2009; Shrivastava, 1995; Soper, 2009).

Constructing Nature

Castree (2001) in his explanation of "social nature" emphasises that "nature" is not an arbitrary or capricious social construction abstracted from "reality". The understanding of what "nature" means emerges from the interactions of humans embedded within ecosystems, of being "in nature". Narratives of nature reflect how we understand or know nature, define how we engage or interact with nature, and finally how we remake, or reconstitute nature either intentionally or unintentionally (Castree 2001).

Our discussion of ecological sustainability situates the maintenance of human livelihood as an outcome of our organization(s) of nature where nature is understood to be an interpretation of how the ecosystems within which we exist function. Founded on localised experiences of human-nature relationships and interdependencies, humans collectively create and then socially endorse preferred approaches for delivering and maintaining a healthy and meaningful existence. Over time such geographically bounded human-nature relationships have resulted in the diversity of social constructions of nature that exist across the globe. We

contend that these activities represent a reification of selected aspects of our social imaginaries (Castoriardis 1987; Taylor 2004).

Taylor (2004) argues that the social imaginary is more than a set of ideas. It is what enables the practices of society and this has both aesthetic and cognitive dimensions. It is a dynamic interpretive practice that is:

1. … the way [people] "imagine" their social surroundings, and … it is carried in images, stories, legends, etc.

2. … shared by large groups of people, if not the whole society.

3. … that common understanding which makes possible common practices, and a widely shared sense of legitimacy. (p. 24)

In raising the concept of "social nature" (Castree 2001) in relation to the study of organizational change we are interested in pursuing two aspects. The first is that social constructions of nature are amalgams of narratives that bound our meaning making and understanding of reality (Bruner 1991), which in turn constrain our decision making. The second aspect is the influence that these narratives of "social nature" have in (re)creating our social imaginaries to (re)define our organizational ecological practices.

In the following section we review extant literature on organizational and societal approaches to making meaning concerning ecological sustainability.

Ecological Sustainability, Organization and Narrative Inquiry

Organizations and Sustainability Adoption

Whilst concepts of sustainability have received increasing attention in organizational studies (e.g. Hoffman & Bazerman, 2007; Linnenluecke & Griffiths, 2009; Packalen, 2010; Smith, 2011), there is still limited empirical work that researchers may draw on the better to understand the meaning making processes underpinning adoption of ecological sustainability in organizations. Although there is a growing body of literature on the requirements for change for sustainability (e.g. Benn & Baker, 2009; Harris & Crane, 2002; Jermier, Forbes, Benn & Orsato, 2006; Newton, 2005; Starkey & Crane, 2003), Kearins, Collins and Tregidga (2010) point out that the concepts nature and environment are different and that further empirical cases that investigate the role of nature in organizational adoption of sustainability are needed. Dryzek's (2005) work on environmental discourses suggests that the difficulties organizations seem to have in reframing their engagement with nature may be sourced in the particular meaning systems, which shape organizational and societal engagement with the natural environment. An organizing narrative (Harper, 2001) frames Dryzek's different discourses, forming the foundations of logic, assumptions, evidence and beliefs by which each discourse's advocates enact these narratives, through reading, writing, speaking and listening. Each of these environmental organizing narratives provides a domain for meaning and sense making, "which serves to stabilize and organize the flux of reality" (Grant & Iedema, 2005, p. 44). For example, Berry's (2001) empirical research shows how the interactions for environmental problem solving are interpreted by corporate stakeholders through two main systems of logic: 'sustainable business' and 'business as usual'. The implications are that approaches for engaging organizations in change for sustainability could be usefully informed by an exploration of narratives that reflect how meaning systems influence social interaction within and across organizations.

Construction of Meaning through Learning and Knowledge Development

In our research, we are exploring the ideas, norms and meanings conveyed in the narratives told to us (Clandinin & Huber, 2010). Narrative is both a mode of knowing and a mode of communication (Boje, 2001; Czarniawska, 2004; Rhodes & Brown, 2005) and is used by individuals and groups to create and share meaning. When individuals and groups engage in meaning making, narrative provides the capacity to explore complex ideas that may be characterised by ambiguity or lack of clarity; it is a way of knowing that allows for competing interpretations (Czarniawska, 2004). We understand narrative as a text presented to a reader or listener that is an account of actions and connected events affecting human beings. Such accounts draw together descriptions of states of affairs paying special attention to the sequence in which actions occur; they recognise the meaningfulness of individual experiences that these events elicit (Polkinghorne, 1988).

Narratives are often discontinuous in their telling, leading to gaps in knowledge exchange and meaning making that is part of the fabric of day to day conversation. These discontinuities may also be magnified by coded meanings that are exchanged in conversations, the understanding of which requires contextual knowledge and cultural embeddedness (Boje, 2008), and becomes known reflectively through sense making processes of retrospection (Boje, 2008; Weick, 1995).

Our study concerns change for sustainability, a key aspect of which is the close linkage of knowledge development and learning at all stages of change processes (Bateson 2000; 2002). Whilst there is considerable debate on the differences or similarities between individual and organizational knowledge development (e.g. Kim, 2004; Tsoukas & Vladimirou, 2004), there is general agreement in the literature that the construction of knowledge is a social process (Berger & Luckmann, 1967), with a substantial literature linking knowledge development to collective action/trust (e.g. Benn & Onyx, 2003; Onyx & Bullen, 2000) and social interaction

"understood broadly as the features of social structure that facilitate action" (Adler & Kwon, 1999, p. 3).

Knowledge development is a process of learning encompassing the acquisition of skill or know-how and contextual understanding or know-why (Kim, 2004). By this means, knowledge is constantly modified and the energy for this movement comes from those who pick up and transmit the ideas in a process of translation (Feldman, Khademian, Ingram & Schneider, 2006). Translation can enable the creation and recreation of our narrative construction of our relationship with nature (the environment). This recreation or redescription of the world uncovers new meanings and hidden patterns (Rhodes & Brown 2005). Here in the creation of new meaning is the interplay through discontinuous fragmented information exchange of prospective and retrospective sense making processes (Boje, 2008) that constitute the ongoing narrative construction of day-to-day life. This fragmented process of sense making can involve critical reflection and continuous reappraisal of our social imaginary (ies) and can progress in a non-linear fashion. As humans, we only order neatly and rationally when we reify our meaning constructions in our historical texts (Wright, Nyberg, De Cock and Whiteman 2013).

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The next section introduces the case organization selected for the research described in this paper and explains the research approach. The paper then proceeds to show how Landcare members, through knowledge development processes, have changed their approach to working their land through a new understanding of their relationship with nature.

The Landcare Network

Organizing for ecological repair: reconstructing land management practice

Within two centuries, European occupation had altered the Australian landscape to result in significant detrimental environmental impact. Damage to land and ecology from European colonisation included loss of soil productivity, loss of biodiversity including extinction of many species, increases in weed and exotic animal pest infestations, greatly reduced water quality and inappropriate land management practices (Beale & Fray, 1990; Lines, 1991; Youl, Marriott and Nabben, 2006). These imported European practices and the shift to industrialised agriculture since World War II resulted in drops in productivity and widespread degradation of farming lands characterised by extensive erosion, loss of topsoil, and increasing salinity of agricultural lands.

Active organizing to redress these problems at local and regional levels was initiated during the 1960s, gained momentum in the 1980s and culminated in the formation of a national programme, the National Landcare Program (Youl et al, 2006). The outcome was the formation of the network-based organization of Landcare whose origins lay in an agreement between two radically opposed groups, the National Farmers Federation, representing conservative farming interests, and The Australian Conservation Foundation, a prominent environmental NGO. The aim was to foster sustainable land management and natural resource management practices in Australia. By 2012, Landcare had become a national network of around 4,500 Landcare Groups operating largely in rural areas actively involving 40 per cent of farmers (Australian Government NRM, 2012). Considering that farmers manage 60 per cent of land and 70 per cent of the nation's diverted water (Australian Government Department of Agriculture, Fisheries and Forestry, 2009), this level of involvement from the farming community represents a significant organizational impact on land management practices. According to the National Farmers Federation (2015), the measure of the success of

Landcare is that 94 percent of farmers throughout Australia are now practicing some form of natural resource management.

Typically, Landcare group members are from the same local community, are often neighbours, and have come together voluntarily over a common environmental issue, such as salinity, weed infestation or erosion. The Landcare organization is associated with an ethos that members help one another out, share information, and engage in capacity building through networking in a number of ways. Collaboration ranges from individuals sharing new knowledge and experience, to organised field days and events that allow many Landcare groups and other stakeholders to come together to exchange ideas and build relationships.

The Landcare Network Organizational Structure

In this paper, we understand organisations to represent all forms of collective activity (Grey (2007). Hence we take a broader view of organisations than restricting them to formal institutions of business or government. The Landcare network is a complex national coalition of community groups, government agencies, regional organizations and a promotional company Landcare Australia Limited. As an organization linking local Landcare groups to government agencies and corporates, Landcare is representative of what Borgatti and Foster (2003) classify as organizational domains specifically characterized by the exchange of various forms of social capital among semi-autonomous units.

The Landcare network operates through three distinct layers. The first layer encompasses the community groups composed of both commercial and recreational landholders. These community groups may be formalised into recognised statutory bodies that take on the role of a centralised point of contact for their local members. A key activity that such formal statutory bodies undertake is the application for funding or resourcing from government

bodies or other sources to support local projects. However, the majority of these community groups are informal structures whose organization is directed around specific projects. Group members may represent many different types of agricultural interests but share an intent to develop learning arrangements and build knowledge around the practices of sustainable farming. Examples of projects range from the practical such as tree planting or fencing off areas to allow regeneration of the land, through participation in research with universities or government research bodies, to political activities aimed at influencing policy changes towards environmental protection of natural resource areas.

The second layer comprises regional representative bodies of Landcare groups, for example the representative Landcare bodies at the state level. These regional bodies organise conferences, arrange interfaces with government and facilitate the sharing of knowledge to underpin capacity building across the networks. This layer also comprises levels of state and local government, that interact with Landcare groups either to provide funds or to control or assist in local projects.

The third layer of Landcare comprises national bodies, such as the principal policy bodies for the federal government that both support and control Landcare funding and capacity building. At this level, an incorporated body, Landcare Australia Limited is responsible for securing non-government funding sources, principally through leveraging the brand of Landcare through licensing arrangements to commercial organizations.

Research Approach: Collecting Landcare Narratives

This paper is part of a wider study (1) which explored the processes of participatory, ecologically focussed knowledge development and learning in Landcare. Our research was designed to elicit how Landcare members and stakeholders understood their experiences of

Landcare projects and activities focusing on the meaning of Landcare, how decisions concerning land management practices on and around their properties were made, which groups and people they consulted and took notice of and how they evaluated Landcare outcomes and culture.

One of the most challenging aspects of sustainability is the complex and interdependent nature of the relationships across and within ecological systems. As a result, transforming the way we as humans manage our natural resources is rarely the responsibility of a single stakeholder (National Land and Water Resources Audit, 2001). The conjunction of multiple stakeholders generates problems around both coordinated planning and participation and the research sought to understand how members of the Landcare network related to their experiences of the various levels of and approaches to natural resource management in their local areas.

The data gathering process involved semi-structured interviews with participants representing local and regional community interests and involvement in the Landcare movement. To capture the multiple layers of interest in Landcare, participants were drawn from Landcare group members, Landcare Coordinators (sometimes termed Community Support Officers, who are funded by governments, or sometimes by sponsoring businesses) and representatives from business and government (local, state and federal) organizations involved in the Landcare network.

Over a period of eighteen months, a total of 42 interviews (drawn equally from the Hunter and Northern Rivers Landcare regions) were conducted, each recorded and supported by field notes. The term "interview(s)" is used throughout this paper to represent both individual and group interview sessions, and unless specifically stated an interview may refer to either

individual interviews or group interviews. The duration of interviews was one to one and a half hours and for group interviews two to two and a half hours.

Data analysis

Analysis occurred through a three-step process, incorporating elements of a grounded approach (Charmaz 2000). The first step was to generate a code map, the second was to code all the data using this map, and the third step was to analyse in more detail subsets of the data to contribute to theory building. Each interview transcript was summarised to identify major themes and ideas. Drawing on Template Analysis (King 1998), the summaries of the interview transcripts were coded manually to generate conceptual trees of the dominant themes to produce a conceptual (code) map that we used for coding the data.

--------- Insert figure 2 code map here ---------

In the next phase of the research analysis, the transcripts were coded using the code map shown in figure 2. The coding was not line-by-line coding, but more akin to selective or focused coding, spanning variable amounts of data (Charmaz 2000, 516), where instead of coding each phrase or sentence for concepts, we identified the underlying themes in the interview narratives. These selections were often identified by multiple codes, which enabled the researchers to deal with high-level abstraction and situate it in a respondent's and their group's narrative(s). This process of applying many labels to the same text, a process King refered to as parallel coding (1998:120), was found to be an important aid in interpreting the research data. For example, the following Landcare quote is described by the codes: knowledge/information, expert, lay, learning, social capital, and informal.

> *'Knowledge is through telling stories not through dry scientific jargon and stuff and not being able to put your knowledge into a story that your average man relates to.' (Bush Regenerator – Northern Rivers)*

The third methodological step was to identify new themes emerging from subsets of the data. The process here was to develop new codes within existing codes to give a more detailed picture of emergent concepts. For example, some of the new themes we identified that frame analysis for this paper include the categories for understanding each of the perspectives and their organising narratives that we present in table II below: nature's bounty, relationships, aesthetic sensibilities and worldview.

The research site

Fieldwork and data analysis centred on two regional areas of New South Wales in which Landcare groups are actively involved in environmental restoration. These regions are the Hunter and Northern Rivers, represented by the Hunter and the Northern Rivers Landcare Groups. The choice of these two regions was influenced by the relative ease of access to their Landcare Group, by the fact that Landcare in these regions is acknowledged as responsible for the development of a number of ecological solutions that were able to be transferred to a wider audience and by the fact that although these Landcare Groups are neighbours, their differences in agricultural practices and population demographics are significant.

Despite their differences, these regions share a history of being settled early in the European colonisation of Australia. The Northern Rivers region has experienced resurgence in population growth, particularly through people consciously looking for alternate lifestyles to modern high-pressure professional city occupations. The agriculture of the Northern Rivers includes orchards (banana, macadamia, stone fruit, tropical fruits) and beef production. The

Hunter is more traditional in its approaches to agriculture than Northern Rivers and is now dominated by viticulture, horse breeding, meat production (cattle and sheep), mining, particularly for coal and a range of other industries, although the Hunter also has accommodated an influx of people seeking relief from high pressure city jobs. In recent years, mining activities have framed the strategies of many of the Hunter Landcare groups, particularly the expansion of open cut mining to meet export demands for coal and more recently, in response to new market pressures, the extraction of coal seam gas (CSG).

The next section sets out a detailed analysis of the research findings concerning the meaning making processes that contributed to the creation of a new meta-narrative within the Landcare organization, labelled in this research as 'ecological repair', a meaning system better positioned to provide for ecological sustainability. The emergence of this new narrative represented a shift from the meaning system of ecological exploitation that had its origins in the European settlement of Australia.

Historical Perspective of Land Management in Australia – Perspective of Ecological Exploitation

The dominant land management perspective that continues to influence Australians is based on an imported European anthropocentric view of nature. European settlement in Australia came with little history of the continent from a European point of view, bar the occasional observations of a number of seafarers and explorers. To European sensibilities, the Australian landscape was an alien one and above all a landscape that needed to be civilised. There was:

> no history of living with the land before industrialisation, no consciousness of making the land a home before the invention of technological civilisation. Instead, Australians

> are accustomed to a highly contrived, dynamic habitat and expanding settlement and relentless invasion of the bush (Lines, 1991, p. xvi).

The important guiding influences on European colonisation were set by the Enlightenment, the beginning of the industrial revolution, and the rationale of the settlement itself (Lines, 1991; Powell, 1976). The underlying assumption of colonisation by the British was the exploitation of the resources that Australia had to offer, with resources to be sent back to Britain and into the machine of industrialisation (eg. Lines,1991). Coupled with this exploitative approach was the imposition of transplanted land management techniques upon the Australian landscape. The introduction of new animals and the intensity with which they were managed and farmed as well as the very nature of land ownership itself, changed the landscape. The result was a re-creation of English farming through land use that was very much at odds with the Australian environment.

This pattern of farming and land use was further refined post-World War II with the industrialisation of agriculture (Lines, 1991; Youl, Marriott & Nabben, 2006). The goal here was the efficient maximisation of the extractive value from the land, a strategy that led to the emergence of highly mechanised large-scale monocultures.

The strong shaping influence of the European view of the relationship between humans and nature is of a duality between human and other life forms. This view conceives of humans and nature as separate constructs, with limited reciprocity between them. Nature is a resource to be exploited for the use and benefit of humans. The implicit assumption is that these resources are limitless. Accompanying this duality is the assumption, imported from the long history of human dictates upon the built environment, that nature can be modelled according to human design principles (Lines, 1991; Powell, 1976). Europeans understood the

ecosystems they encountered as able to be transformed to fit the model of European ecosystems with which they were familiar; their sense-making narratives were their imported inherited cultural stories, which they imposed on the new landscape they confronted.

The combined effect of these land management practices led to the impoverishment of soils, best seen in areas like Western Australia where extensive clearing of land to grow crops has led to serious salinity problems in the wheat belt area (Lines, 1991, pp. 262-263). It is in this context of ecological exploitation that the Landcare movement arose to repair the damage that was being done to agricultural lands.

Findings

Key features of the Landcare groups studied in this research were their strong sense of place, their apparent engagement in a virtuous cycle of learning occurring through both knowledge transfer and creation and the fact that this cycle of learning acted as a process of organizing associated with change towards sustainability.

Knowledge Transfer – Learning from Different Sources.

In the early period of the development of the Landcare groups we studied, respondents reported that Landcarers were particularly reliant on academic or bureaucratic assistance and research to understand the local ecology and the practices needed to regenerate degraded environments. Borrowed knowledge (Kuhn, Woog & Hodgson, 2003) was and is sourced from ‘experts’ and this remains a conscious strategy for capacity building and for increasing the sustainability of agricultural practices in both the Hunter and Northern Rivers areas. Respondents recalled that when Landcare formed in the late 1980s, the experts who were consulted tended to be associated with universities and other institutions recognised as having

bodies of scientific or specialist knowledge. Our data analysis shows that over time the definition of 'expert' has changed and broadened, as Landcarers have come to recognise that the landholders themselves and others associated with regenerating the native vegetation, have a particular form of knowledge: local knowledge (Wynne, 1996). This is expertise developed from observation that can augment, illuminate and correct borrowed knowledge from scientific and academic sources:

> *'People like […] have been in the area for 50 years and he, for example, could say that in the […] area he'd taken out the round leaf gum. He could also tell us that by the time he'd got there all of the cedar and turpentine had been cut out by earlier timber-getters, and that the reason that they cut out the sandpaper fig is because in that area they had orchards, particularly peach orchards, and the sandpaper fig attracted bats, probably the grey spectacle bat. They believed that the bats would be harmful to the fruit so they cut it out … That local knowledge particularly from old people, is enormously valuable. It becomes elusive with time.' (Landholder (2) - Hunter)*

Knowledge Creation – Developing New Local Knowledge.

Our findings highlight that generated knowledge develops within the context of the local group or organization. This created knowledge may derive from extending, adding to or applying in new ways borrowed knowledge, or, alternately from radical new conceptions and understandings of problem situations (Kuhn et al, 2003). Our data shows that generated knowledge in the Hunter and Northern Rivers Landcare operations tends to be practical and built on the application of borrowed knowledge reworked by experience acquired in its application. As such, the development of this knowledge is recognised as an important process in local capacity building:

> *'Here it seems that one of the things that's really unusual is the way in which scientific knowledge has been brought together with local knowledge in practical projects.' (Landholder (3) - Northern Rivers)*

In effect, what has developed over time in the case of Landcare is a tight coupling of generated knowledge to practical ecological solutions. In the Northern Rivers, many groups captured rainforest knowledge in the Weed and Rainforest Regeneration Manuals that are now used as classic reference texts throughout the eastern seaboard of Australia.

> *So we accumulated some information and then we set about producing a rainforest restoration manual and a rainforest weed manual…Tomorrow I'm going to look at the pre-production view of the second edition of the restoration manual, which is that...Now those things get sold from southern New South Wales to you know central Queensland because they're sort of the definitive data sources. (Landholder (4) - Northern Rivers)*

In the Hunter, innovation took forms that the researchers consider to be characteristic of tacit knowledge creation and exchange (Nonaka, 2004, p. 168), where knowledge is embedded in action and involvement in specific contexts. An example of tacit knowledge identified in the interviews was the development of long-stemmed tube stocks, a technique that enables plants to be established deep in the soil in a way that maximises their chance of survival and mitigates their vulnerability to flood and wind. The cultivation and application of long-stemmed tube stocks is knowledge that is difficult to transmit in formal, methodical language, it is more effectively understood and transmitted through practice.

> *One of the easiest ways of showing how knowledge can spread through the network at the shire level is quite some years ago, Wollombi Landcare developed a technique for*

> *using long stem tubestock. This allows you to establish plants deep in the soil, even 3 metres deep in the soil which means that they don't get knocked over by winds or by floods if they're in friable soils or sandy soils and things like that. They're particularly suited for riparian vegetation on the sandy soils that we've got. First of all they developed the concept of the tubestock and secondly they developed the technique of putting it into the ground, which involves a water lance. That was an idea that they got from vineyards because it's a technique used to plant vines. … There's no way in the world that I would have known about that or learned about those techniques if it were not for the existence of the network. (Landcare Wollombi Group - Hunter Region)*

Similarly to the Rainforest and Weed Manuals developed in the Northern Rivers, this innovation has been widely adopted beyond its originating Landcare communities.

The new knowledge developed in each region reflected the interaction over a considerable period between the land and its stakeholders. In the Northern Rivers, a process of experimentation between the lush tropical landscape and 'life-style' Landcarers resulted in new knowledge concerning regenerating native vegetation, very different new knowledge to the Hunter, where a harsher landscape and a Landcare community more concerned with remediation of their properties, resulted in forms of new knowledge, geared to ensuring sustainable land management practices on their farms.

Emergence of the Perspective of Ecological Repair

Changed ways of knowing what is meant by good land management practices and changed behaviours that embody this new knowledge underpinned ecologically focused remediation and repair. The change in awareness and shift away from the logic of the colonial perspective

of ecological exploitation happened in small ways and at first often led to unforeseen developments. The process itself became exciting and important to Landcarers.

The process of sense-making described here is subtle and takes place in small increments often characterised by temporal distance between the initial observation and the moment of awareness. The Landcare case is a different but no less important model of sense-making to that characterised by Weick in his Mann Gulch (1993) and Bhopal (2010) cases and in the example of US Federal Reserve's policy making analysed by Abolafia (2010).. Views of sense-making usually assume a short temporal distance between the cue event and the enactment that follows. In contrast, in our case study of Landcare, we can identify cues that are characterised by long periods of time between the signal and the enactment that follows. While this temporal lag is noted in the literature (see Weick's description of the cue on child abuse 1995), our case highlights that the cues acting on the Landcarers were long ignored as merely individual or eccentric instances. When the cues were recognised collectively, facilitated through interaction within the Landcare organization, they then constituted the disruption to the Landcarer(s) meaning system that generated the cognitive dissonance characterising a cue in Weick's framing and a cognitive gap in Dervin, Foreman-Wernet and Lauterbach's (2003) framing of sense making.

We label this temporal lag and the aggregation of cues as 'protracted sense-making'. Protracted sense-making occurs where a collection of cues, each able to be ignored individually but not collectively, provide the dissonance needed to stimulate sense-making action. In the case of Landcare, the temporal lag involved in recognising that farming practices were damaging their landholdings spans decades.

In Table l, we give examples of texts that reflect incremental processes of sense-making occurring in considered critical self evaluation by land carers from both regions. These responses show that subtle cues can act over time to develop awareness and understanding of the ecological needs and responses to the landscape.

Insert Table l about here

In our study, we noted that this noticing and bracketing (Weick, Sutcliffe & Obstfeld 2005) of observations led to the enactment of a new ecological meaning system that we label 'ecological repair'. While the perspective of ecological repair highlighted by our data has its foundations in that of ecological exploitation, it has developed new interpretations of the human-nature interrelationship to both guide and reinforce its retelling and enactment. For example, the two perspectives view the Australian native bushland in dramatically different ways. From the perspective of ecological exploitation, the natural bushland is a wasted resource, while potentially harbouring agricultural pests, mammals, reptiles and insects.

In contrast, ecological repair views the native bushland either as having intrinsic value or as a productive resource to be integrated into farming practices. An example of this integrated approach, described by one of the landholders from the Northern Rivers, was the use of separation areas between macadamia trees and bushland that were kept trimmed close to the ground, an integrated ecological solution that had the effect of protecting macadamia nut crops from rats by creating open space that provided advantage to the rats' predators.

Discussion

Our case shows that the organization of 'land care' and the organization that is Landcare represent a deliberate attempt to change the 'meaning systems' through which the natural environment is understood. Emergence of a new perspective of ecological repair reflected changes in the way landholders related to nature and the effect this had on their 'farming' practices. Our findings suggest that the adoption of ecological sustainability requires alteration of the social imaginary achieved through changes to the narratives that organizational actors use to make sense of their interaction with nature and to underpin their decision-making.

The protracted sense-making in Landcare that led to the generation of ecological solutions was enabled by a shift in the social imaginary that reflected and enacted a change in the landholder's relationship with nature. The mechanisms that facilitated this shift in the social imaginary were a set of discursive structures, both implicit and explicit, that were created to resolve the environmental problems facing each landholder. The aspects of these discursive structures highlighted in our research are the dialogic engagement with nature, the influence of organizing narrative and the socially interactive processes of learning that lead to resolutions to the environmental problems faced by the Landcarers we studied.

Dialogic Engagement with Nature

Working in the landscape or the physical environment that bounds the decision-making and actions of people engaging with the land is both an individual and a social process that tests existing and generates new ecological knowledge. The landscape provides the context for 'the social production of culturally valued skills' (Hardy, Lawrence & Phillips, 1998, p. 71) that are shared and validated within the community of Landcare at all levels of the organization,

local, regional and national. These skills are the processes of enactment that are essential to sense making (Dervin et al 2003; Weick, 1995), and without this collaborative action, we argue that new ecological knowledge would not be integrated into the constructed narrative(s) of Landcare.

The farm and its surrounds, the landscape, is an active stakeholder (Starik, 1995); it is an actor in a complex network of relationships (Callon, 1986) that requires Landcarers to learn new ways of communicating and interacting. The Landcare groups create knowledge and action focused on promoting sustainable land management practices that are locally attuned and appropriate. On this view, landscape itself 'communicates' with Landcarers.

> *We have a program in Western Australia called Gondwana Link which is actually about over 100 km space of a whole heap of land tenure and land use between two really significant remnant areas of vegetation and gradually over about a 10 or 20 year program there will be corridor and habitat linkages developed between those two remnants. It's looking at a landscape scale of land use…And we had another guy talk about it on a landscape scale and I was talking about it on a property scale…and then you can look just a little bit outside your property and look at Goonengary State Forest over there, then there's other areas adjoining your property which effectively enlarge the area that you've got and the birds that fly over and drop the seeds in. So it was like explaining that its not just an isolated pocket and getting farmers to think not just about their little orchard of nut trees but to think about the whole farm and then to think about its relationship in the landscape to try and get that focus just off production.(Facilitator - Australian Environmental NGO)*

The Landcare narrative is characterised by such a reflexive response (Hardy & Clegg, 1997; Rhodes & Brown, 2005) stimulated by a conscious learning process (Kim, 2004) engaged in over time by Landcare members as they respond to their landscape. Stimulation of reflexivity is the means by which the landscape actively engages with landholders' narrative(s), often following this pattern: 'When we bought this property it was the beauty of the area that captivated us and it was some time later that we realised that the remnant rainforest on our block needed looking after.'

Active reflection on their land holdings and environs promotes a cycle of engaging experts in local vegetation, bush regenerators, that leads to increased understanding of what an ecologically sustainable environment should or could be.

Dialogue with the landscape takes many forms. Traditionally the colonial perspective has been about controlling the environment rather than collaborating with it. The Landcare lesson is to engage in collaborative dialogue to perceive the environment differently, to understand its diverse and unique character and needs and to act responsively and responsibly in relation to it. These new ways resulted in a different approach to managing and valuing the land; the aesthetics of what constituted good farmland changed so that it was now seen to need large patches of native forest to break up the farmland and this reforestation improved the beauty of the landscape while also adding to the fertility of the land.

Whilst the livelihood from a productive farm was still important, it was also balanced with a recognition that the landscape also needed care; a reciprocal arrangement was needed between landholder and the land that benefited both, and this change in practice and approach to farming was enabled by a new (re) construction of the landholder's relationship to and with the land supported by a new meta-narrative: 'ecological repair'.

The relevance to protracted sense-making through meaning creation and in particular the dialogue of the landscape is that Landcarers have pursued a deliberate reflective process to better understand what is needed to restore their lands. Our argument is that the natural environment 'communicates' in indirect ways that need interpretation and that this interpretation is fashioned by our systems of meaning framed by our social imaginary. A shared recognition exists across both regions we studied that an imported/exotic model of land management has debilitated the environment and that this model needs to be reimagined. The resulting shift to regeneration and sustaining farming practices is the outcome of this re-imagining and is in our view only possible because the understanding of 'our' relationship with the land has been recreated to provide a new map to guide local action.

Influence of Organizing Narratives

From the analysis of our data we identify two organizing narratives, and their structure, each representing a different social imaginary: one that can be described as a 'dominating' socially endorsed narrative and the other an 'emergent' narrative (summarised in Table ll). Each influences the engagement of landholders with their physical environment and the way landholders approach their day to day activities supporting their livelihood. The dominating narrative is the imported colonial narrative labelled in this research as 'ecological exploitation'. The other narrative which emerged in response to the environmental shortcomings inherent in the dominating narrative is labelled as 'ecological repair'. The narrative of 'ecological repair' is both a response to the actions and changes of the community as they interact in new ways to their landscape, and an enabler of looking at that landscape with a different lens, thereby facilitating change and the development of new initiatives in the community.

Insert Table ll about here

As organizing narratives, ecological repair and ecological exploitation frame worldviews and impose boundaries on the opportunities and constraints that govern activities and restrict understandings of what is real. This research suggests that the emergent narrative of ecological repair is a creative response by Landcarers to resolve the problems that are inherent in the dominant narrative of ecological exploitation and that the resolution of these problems cannot come about until there is some form of shift in the enacted organizing narrative. These findings point to a relationship between change, narrative (re) construction and re-imagining the human interrelationship with the rest of nature that has broad application for organizational and social change.

Socially Interactive Processes of Learning

Garud, Dunbar and Bartel (2011) suggested that narrative development assists in the organizational learning process. They argue this occurs through narratives acting as boundary objects, enabling actors from different backgrounds to summarise and communicate information, to subsequently act upon the information and thus to build the memory necessary for future action to take place.

The different understandings across the two regions indicate that the landscape itself 'communicated' to the landholders and in so doing contributed to the re-imagining of the interrelationship between landholders and nature made explicit by the emergence of the narrative of 'ecological repair'. This dialogue between the landscape and landholders was (is) a slow process that is characterised in this paper as collective cueing that leads to protracted sense-making.

The argument made here is that this engagement with the land through protracted sense-making is a process of enactment (Ford, 2002), a creative process of action-perception-sense making that uses knowledge of past experiences to build new knowledge through a process of narration (Boyce, 1996 Cunliffe, Luhman and Boje 2004; Luhman, 2005; Rhodes & Brown, 2005; Tsoukas & Hatch, 2001). The interdependency of past, future and present in these everyday interactions is essential to understanding sense-making (Boje, 2008).

By examining the processes of change, captured in the narratives, as they occur through the locally situated dialogue of both human and non-human actors (Starik, 1995; Callon & Latour, 1992; Newton, 2002) in the two case Landcare regions, we were able to understand some of the ways in which knowledge of sustainable land management techniques has been translated through the Landcare regional organization networks. Change emerged as a direct result of the overarching organizational aims of Landcare, yet the ways in which these have been shaped by the physical environment and the purpose of the land management activity reflect regional differences, such as the different agricultural and industrial uses of the land.

The primary means of bringing about change was the emergence of the narrative of ecological repair as Landcarers responded to protracted sense-making of the outcomes of their farming practices. We argue that this emerging narrative is implicit and created simultaneously (Boje, 2001, 2008) with the explicit learning processes described above, and yet, we can only know this constructed narrative retrospectively (Weick, 1995) through processes of reflection as we consciously make sense of our actions. Our findings here concur with the observation of Abolafia, “the emerging narrative is a text that is the basis for action (2010, p. 360).”

Conclusions

In our cases of Landcare groups in two regions of Australia, we found the development of ecological solutions was stimulated by protracted sense-making facilitated by processes of learning to re-construct the understanding by Landcarers of their relationship with nature. Hence this paper makes an empirical contribution to expand our understanding of how sense-making occurs as an ongoing reflective process labelled here as protracted sense-making, an iterative process of observation, categorising and action guided by mental models, as outlined by Weick et al (2005). We have offered examples from Landcare in which significant change occurs through the aggregation of small subtle cues and suggest that these patterns of sense-making, which make explicit the relationships between systems of meaning in organizational settings and the nature of their ongoing influences on individual and organizational actions, are able to be found in all processes of organizing.

Implications, Limitations and Further Research

Supporting Orr's (2006, p. 1816) argument that 'social reality is constituted through interaction, which would include but not be limited to language', we have also shown how relationships between Landcare stakeholders led to the creation of a new narrative reflecting a new system of meaning that enabled local communities to improve the viability of their ecological environment. Our observation was that stable patterns of meaning are slow to change and our research findings have led us to conclude that for organizational change toward sustainability to take place, an active re-imagining of the meaning system within which humans situate themselves in relation to their environment needs to be present. Starkey and Crane (2003, p. 232) strongly advocated a similar position in their contention that sensitising management to green issues requires active construction and dissemination of a narrative presenting a new environmental paradigm that can stimulate change through sense-making, and proposed the creation of a narrative structure: the 'evolutionary epic' through

which this construction may happen. The Landcare case presented here is an example of what can happen when new patterns of meaning are created and highlights the importance of supporting social processes in generating these new narrative structures.

This paper argues that ecological sustainability practices are the outcome of a multitude of decisions that are taken at all scales as people engage in the large and small tasks of their daily lives. The shift to ecological sustainability in our case study of Landcare was made possible through the creation of a new social imaginary, resulting in a new system of meaning(s), that emerged as Landcarers engaged in remediating destructive land management practices. Our work suggests that the study of the role (s) of the social imaginary (ies) enacted by individuals and organizations offers rich research possibilities to better understand practices and behaviours needed to redress the ecological problems facing organizations and their wider societies.

Our project and the discussion in this paper focused on investigating narratives that influenced sense-making and decisions within our Landcare groups. What emerged during our analysis was the important role of emotional engagement in the learning processes Landcare members undertook. A limitation of our application of narrative inquiry was that in the research design, we did not explicitly include investigation of the role of values and beliefs in the sense-making and learning process undertaken by Landcarers. Further work would be useful to explore the connection of values, beliefs and decision-rules, and the creation and enactment of the organizing narratives identified in Landcare, "when facing qualitative environmental change" (Meyfroidt 2013. p.341).

While this case study investigated two organizing narratives, ecological exploitation and ecological repair, it is important to also acknowledge a third narrative in the margins of the

interviews that not pursued in this paper: the suppressed pre-colonial Indigenous environmental narrative. The area of interest for further research is the question of how suppressed narratives influence dominant narratives, and what changes to both the suppressed and dominant narratives result from this influence. We suggest the existence of a hierarchy of power relations in representational voice between and among these three organising narratives: the dominating, the emerging and the suppressed.

In the Australian environment, the colonisation by Europeans pushed aside Indigenous narratives and supplanted them with an imported one derived from experience with European ecology (Sveiby & Skuthorpe, 2006). However, Indigenous pre-colonial narratives did not disappear. Indigenous populations, their cultures and narratives, did not die out but continued, albeit dominated by the introduced colonial culture and its systems of meaning. With the coming of Europeans, a shift in the power relations of extant narratives occurred in which the Indigenous voice was relegated to the background. The consequences for narrative studies of such a shift in representational voice has attracted increasing attention from organizational researchers (e.g. Boje, Oswick & Ford, 2004; Buchanan & Dawson, 2007; Rhodes & Brown, 2005). The shift in power relations noted above also raises interesting research possibilities for investigating the influences distinctive social imaginaries have on each other when they interact in a shared social setting.

Notes

(1) Funding for xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx."

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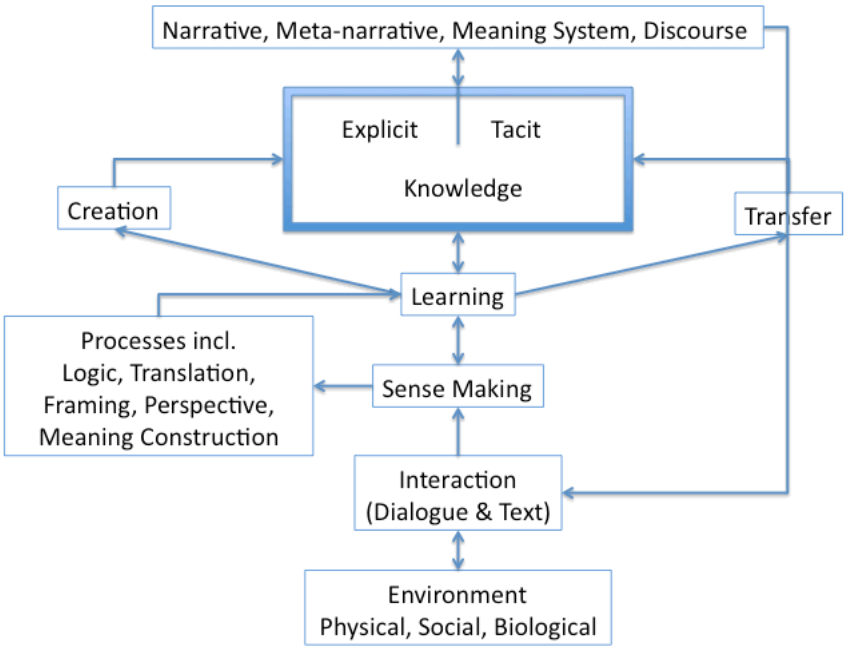

Figure 1. Processes and Constructs of Learning and Knowledge Development.

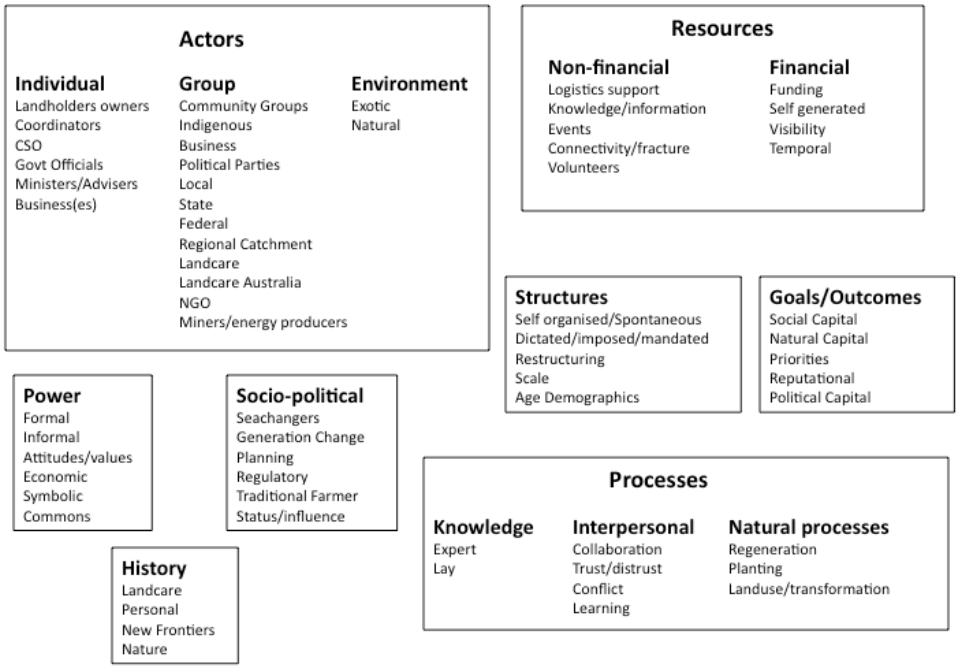

Figure 2. The Concept Map (Code Map)

Table l. Examples of subtle cues that stimulate sense-making	
Temporal lag due to dialogues with nature.	*'And the local knowledge even was like with us we had no idea so we learnt through fortunately people like […] who lived here and were able to instruct us on how important our property was. We didn't know, we bought it because it looked beautiful and then the problem was how to rid our property of weeds and then re-plant.' (Landholder (1) – Northern Rivers)*
	I'm a farmer and I work land with my 5 brothers on the escarpment. My interest in trees started about 14 years ago when I

	was just curious as to what trees I had on my property. I didn't know the names of them so got [an expert] down to have a look. I remember that day as if it was yesterday. He got us all excited …, about what species were in this gully. We learned a lot that day and we've continued to learn since.' (Landholder (2) – Northern Rivers)
Temporal lag due to the knowledge acquisition and sharing practices within Landcare groups.	*'You get a call from someone and they've just moved to the area, they've heard about Landcare and think they've got some native vegetation. The best place to start with is just to give them that little taste of information and encourage them to ring round, go to field days, and not to do anything with their farm until they've probably spent six months talking to people.' (Government Officer – Northern Rivers Catchment Management Authority)*
	'I wouldn't have known about it except for the (local) Landcare network and I've been in a position where because of the network I'm out there showing people … how to use the water lance, how to use long-stem tube stock and know the advantages of it. There's no way in the world that I would have known about that or learned about those techniques if it were not for the existence of the network.' (Landholder (1) - Hunter)

Table ll. Organizing Narratives for Human – Nature Interaction

	Ecological Exploitation (dominating)	**Ecological Repair (emergent)**
Natures Bounty	Resources provided by nature are limitless – once exhausted locally new sources will be found	Resources provided by nature are finite – once exhausted they will be lost forever
Relationships	Hierarchical Nature can be modelled to suit human needs; organization of nature is abstracted from reality and imposed	Co-equal Reciprocal relationship, nature and humans shape each other; collaborative dialogue
Aesthetic Sensibility	Alien to European / civilised sensibilities and valued instrumentally.	Beautiful and valued intrinsically.
Worldview	Problems can be fixed by replacement or imposing a corrective technology Nature is raw material to work with – nature can be improved	Problems can be fixed by understanding natural processes and changing organizational practices Nature is a partner