

## Education in Landcare groups: social learning aspects of adaptive management

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**Abstract.** Social learning in promoting natural resource management (NRM) can be characterised by collections of practices. Education for sustainability practices have unique structures, which can be analysed to provide insights into the social aspects of learning. Drawing on Schatzki's theory of social practices consisting of collections of sayings and doings, I examine the social learning practices found in Landcare. This paper describes the experiences in conducting case studies in several Landcare groups in the Murray-Darling Basin, Australia. The research is contributing to the understanding of the social learning practices in community-based groups of environmental volunteers, using Landcare groups as an example. Discourse analysis is used to explore data created from semi-structured interviews with landholders, participant observation of Landcare groups, and historical document analysis from the Landcare groups. The results highlight characteristics of informal adult education in natural resource management – and demonstrate potential contributions to capacity building in environmental groups, practice, theory and to inform policy. Three key issues are: (1) important informal education processes occurring in Landcare; (2) implementing new practices in education for sustainability (Efs) at the grass-roots level; (3) encouraging policy developments to promote NRM learning

**Keywords:** informal adult education, community-based volunteer, NRM, practice change

### Introduction and background

Climate change is predicted to add to the degradation already occurring of agricultural land in the Murray-Darling Basin (MDB), creating further reasons to address the sustainability of agricultural practices. Brundtland (1987) introduced and defined "sustainability" as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The United Nations (UN) has declared the UN Decade for Education for Sustainability (2005-2014) explaining that education is "...humanity's best hope and most effective means in the quest to achieve sustainable development" (UNESCO 2003). Australian and international educators are emphasising the need for new and urgent developments so as to be able to meet the challenges of sustainability and sustainable development in a timely manner (e.g. Fien 2003; Stone and Barlow 2005). Fien proposes that education for sustainability (EFS) can increase the world's capacity to "confront and master change".

The Landcare movement has been an important part of grass root efforts to combat and reverse land degradation Australia-wide (e.g. Curtis and Lockwood 2000) and its importance could grow as the impacts of climate change increase. Landcare is a particular manifestation of a broader class of community-based environmental volunteer groups (CBEVG). Various implementation models for administration and funding CBEVG have been utilised over the almost twenty-five years of Landcare (e.g. Pannell, Marshall, Barr, Curtis, Vanclay & Wilkinson 2006). However, the processes of education and learning within these community groups, composed largely of adults, are under-researched and under-theorised. This paper explores informal adult education as evidenced in four Landcare groups based in the MDB. Key questions that guided the exploration were: what are the defining characteristics of Efs in a Landcare context and how does learning occur? Hence, before exploring the case studies a word on Efs is needed.

### Education for sustainability and practices

Efs has a set of practices that are different to the practices used in normal 'education' (Kemmis, Adlong, Cooke, & Mutton 2008). The Efs practices identified by Kemmis et al. 2008 are organized as sets or bundles of sayings, doings and relatings, where the bundles have distinct purposes together with "...moral and emotional commitments that shape and structure practices" (Schatzki 2002, cited in Kemmis et al. 2008, p 1). Wenger (1998) uses the notion of communities of practice (CoP) to describe structures of social learning in different practice settings. Table 1 orients the sayings, doings and relatings - with examples of these - in the dimensions of natural resource management (NRM) activities within the Landcare groups.

**Table 1. Evidence of actions and meanings of practicing EfS**

<b>Actions - bundles</b>	<b>Dimension &amp; medium</b>	<b>Practice architectures (mediating preconditions)</b>
<i>Sayings, knowledge:</i> "Thinking green", "thinking sustainability" and speaking about relevant topics	The cultural-discursive dimension (in the medium of language)	<i>Cultural-discursive preconditions:</i> Eg. discourses of sustainability (like discourses of ecology, environmental science)
<i>Doings:</i> "Acting green", "acting sustainably" and doing relevant things	The material-economic dimension (in the medium of work)	<i>Material-economic preconditions:</i> Eg. natural conditions that constitute 'environmental problems'
<i>Relatings:</i> "Relating to the world in a 'green' or sustainable way" and changing relationships to others and the world	The social-political dimension (in the medium of power)	<i>Social-political preconditions:</i> Eg. social relations involved with 'active citizenship' or 'environmental stewardship'

\*After Kemmis et al. 2008.

**Case studies**

A multiple case study approach was used to characterise EfS in the groups (e.g. Yin 2003; Stake 2006). The research was conducted with four Landcare groups geographically adjacent to Wagga Wagga; three rural-based groups and one urban group located in a small regional town. The data were collected in 2008 and 2009. The data comprise transcripts of semi-structured interviews of Landcare group members, field notes from participant observations of regular meetings, and the groups' historical documents such as meeting agenda and minutes, project descriptions and reports. The size and the activity levels of the groups are summarised in Table 2. Note that activities were defined as specific on-ground works.

**Table 2. Summary of the activities of four Landcare groups in the MDB (2008, 2009)**

	<b>Number financial members*</b>	<b>Meeting frequency</b>	<b>Median attendance</b>	<b>Regular Newsletter</b>	<b>Activities/ year</b>
Landcare Group 1	102	Monthly	7	Yes	1 - 2
Landcare Group 2	28	2008: 2-monthly, 2009: - monthly	9	No	1 - 2
Landcare Group 3	32	Dormant (no meetings since 2007)	0	No	0
Landcare Group 4	15	Monthly	6	Yes	10 - 12

\*Note that membership is often paid for as a family group

Only Landcare Group 4 organised regular on-ground work such as tree planting in the twelve months period 2008-2009 (Table 2). Landcare Group 1 (LG1) and Landcare Group 2 (LG2) continue to have regular meetings. However, observations of those meetings reveal the basic meeting procedures are followed (i.e. the members present are recorded; apologies, the last meeting's minutes are read; matters arising are discussed; correspondence in and out; treasurer's report; and general business) and action outcomes or decisions are rarely needed. This provides evidence of the functioning of a community of practice (CoP) as defined by Wenger (1998, 2008a, b, p 1) where participants "share a concern... for something they do and learn how to do it better as they interact regularly". In this case the members are continuing the connection to the CoP to preserve the practices as 'sayings' and 'relatings'. When the groups are still meeting regularly, even though there may not be any planned projects ('doings'), they are enacting the practices of 'Landcare' – in continuing to enact practices they are ensuring that the historical meaning of Landcare meetings in their group is perpetuated, until such time as there actually are new projects to do. This may be when appropriate funding becomes available for a project, or there is some significant rainfall for tree planting.

A number of themes related to how learning is occurring emerged from the data, which have been analysed using the themes in Table 1.

### The occurrence of learning

How is learning occurring within these groups? Table 1 suggests that, if EfS is occurring, it should manifest firstly as individuals in the groups adopting new 'sayings' (discourses) which contain new ideas and perspectives about their world. Secondly, they develop new ways of 'doing' things in response to the needs of sustainable agriculture. Thirdly, they develop new ways of 'relating' to each other and to the landscape in the course of their activities in the groups. That is, it is anticipated that people in the Landcare group – and others around them – will begin to relate in new ways to each other, to those people 'external' to the groups, and to the environment. These are seen in the relationships to both one another and the world. Such changes do appear to be happening in the groups of this case study, as discussed below. Different Landcare groups have different areas of activities that evolve over time and are influenced by factors such as drought or government policy directions.

**Table 3. Examples of how practices are transforming**

Actions – 'bundled'	Then	Now
Sayings, knowledge, thinking	Salinity, erosion, acid soils – 'simple' problems	E.g. Ecology, biodiversity, soil carbon – as 'complex' issues
Doings, activities	Fencing, tree-planting	E.g. Dung beetles, changing soil management
Relatings, interacting	Government funding projects, reports	E.g. More non-government organisations, new 'experts' - biologist, agronomist

As might be expected when new discourses enter the sustainability debate (such as when soil carbon is being discussed, e.g. Table 3) further key relationships are created as group members learn to talk the talk and walk the walk.

#### ***Social learning / informal learning***

Using the matrix of sayings, doings and relatings provides a space for demonstrating transformations of practices over time, as they change due to forces such as policy, environmental concerns, or climate change (see Table 1). Taking a then and now scenario, based on the data from the case studies (using as a baseline 1990-91 for 'then' and 2008-09 for 'now'), I find that there are changes in tasks associated with practices (see Table 3). When a farmer adopts a new practice of pasture cropping with minimum tillage, s/he modifies the practices, the bundle, associated with sowing a crop. Previously for example (then), there was often a series of soil preparation stages such as scarifying and ploughing. Now they have a modified seeding set-up to direct drill the seed in the pasture. There are new, different chemical and fertilizer rules now. The farmer is dealing with different consultants for advice, and while this is occurring the farmer's thinking has changed as they see perhaps better yield, an improvement in the soil, some remnant vegetation regenerating, or the return of bird species.

Groups may have particular bundles of practices that they require to carry out sustainability activities. Practices involved in knowledge development have particular sets of 'sayings' around an activity, for example when a group meets to discuss a project like revegetation work along a creek. The discussion may be initiated by a new round of funding that has been advertised, and the group members meet to decide whether there is an opportunity within their sub catchment to take up the funding. From this discussion a tract of degraded creek might be identified. The members will need to assess the area – e.g. measure the length of fencing required, and the area required to be planted for trees, as well as use their knowledge of their landscape to nominate the types of vegetation to be ordered. These are the sayings as in Table 1 that presupposes knowledge of someone of the various elements of the discussion. It is important to note that the knowledge required to complete the evaluation will probably be distributed among the members – not all have detailed knowledge of the varieties of trees that will be planted in that particular section of the creek, not every member may have detailed understanding of the number of trees required to be ordered and so on. The relevant knowledge is distributed among members, and the members themselves may have networks of relationships ('relatings') outside that particular group where they access particular information. The networks are essential in the social dimension, as evidenced by the fact of them participating in the Landcare group, as they are all demonstrating their shared values in carrying out sustainability activities (see also Kemmis et al. 2008). This can be demonstrated in the same manner for 'doings', where the

action (the on-ground work) has distinctive features related to sustainability practices. Collectively the group has the skills for preparing the area to be planted, carrying out the fencing activities, and planting and later monitoring and reporting on the site, but not all individuals have all the skills.

In practice there is a spread of skills and knowledge levels among participants that relies on the social aspects of the groups to bring together all those ‘knowledges’ and skills into the particular practice being developed or transformed. The use of practice architectures can demonstrate some overlapping and interdependencies thus suggesting that they are *social products*.

**Practice architectures**

Considering that the bundles of practices are not then solely the products of the individuals in groups, Schatzki (2003) introduces site ontologies as being locations of where practices occur in the social contexts. Uncovering the structure and relationships of practices within Landcare is aided by the use of the site ontology examples by Schatzki to elicit the nature of the social settings (Schatzki 2003 pp 177-179). Taking his example of bank loan practices, the practices involved with sowing an autumn crop can highlight some agricultural practices (p. 192):

- Meetings with agronomist, other consultants
- Prepare machinery
- Purchase seed, chemicals, fertilizer
- Communications such as telephone calls to arrange a cartage contractor.

The activities forming the practice are linked by three phenomena:

1. Understanding – that is knowing how to carry out an action / task, under a given set of conditions (e.g. prevailing seasonal conditions)
2. Rules – such as those controlling the application of fertilizer or weed chemicals
3. Combinations – the guidelines of the task/project that signify meeting targets such as crop yield and earnings.

Table 4 gathers together the overlapping bundles of practices to demonstrate how NRM activities in a Landcare group can be interpreted in a larger social context. This framework can be used to link the practice bundles associated with the domains such as soil, water and air.

**Table 4. Activities as practices and bundles: examples of domains and types of NRM practices**

Domains	Practice ‘Bundles’	Landcare Activities	Landcare Discourses
<b>Soil</b>	Organic agriculture (include soil testing) e.g. permaculture, organic farming courses	Monitoring, dissemination of information Guest speakers Distributing dung beetles	Soil quality Soil carbon Biodynamics
	Salinity and gully / water erosion control	Planting trees Fencing	Community action Biodiversity
<b>Water</b>	Salinity, e.g. saltbush planting Water quality, e.g. WaterWatch Water environments, eg wetland development	Piezometers – auditing Planning & participating in program of water conservation	Ecology Water Waste Recycling Conservation
<b>Air and air quality</b>	Dust/ wind erosion Stubble burning	Minimum & no-till Direct-drilling Native pastures	Conservation Soil carbon
<b>Biodiversity</b>	Revegetation, e.g. landscape restoration, indigenous seed collection, propagation, planting	Planting	Ecology Biota Biodiversity
	Weeds and pests, e.g. Weed Warrior programs	Monitoring pest weeds	

\*After Kemmis et al, 2008

**Discussion**

To advance sustainable agricultural practices in the face of climate change requires individual farmers and their related communities to learn as they manage, an approach that is often referred to as adaptive management. Allan and Curtis (2005) note that active adaptive

management (as opposed to the evolutionary or passive categories), acknowledges the complexity of issues by encouraging the involvement of multidisciplinary and multi-stakeholders combined with a “strong emphasis on social learning”. In addition, Allen and Jacobson (2009) emphasise that types of learning needed for adaptive management may not necessarily have greater importance over each other, rather that they may all be utilized at various phases. If we overlook the informal learning processes, there is a risk of losing the structures that support and enable this social learning – and we will have lost the opportunity to harness a valuable benefit of CBEVG. Allan and Curtis (2005) point to the inadequacy of leadership at organisational levels in providing support for implementations of adaptive management. They also note cultural issues and prevailing values in NRM that constrain success in adaptive management – could this be a result of lack of insights into the social learning aspects?

This article has drawn on research into the learning practices of Landcare groups to highlight some of the changes that are taking place in the groups studied, and to provide a possible framework for future discussions with professionals who are responsible for facilitating development in NRM, and policy makers who are able to evaluate current administrative and funding structures and their role in supporting the development of the groups. Dealing with the need to use the knowledge of social learning by the individuals in future strategies and policies can improve rural sustainability outcomes.

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