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Mapping Sustainability Initiatives Across a Region: An Innovative Survey Approach

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Abstract The project of mapping sustainability initiatives across a region is part of a larger program of research about place and sustainability education for the Anthropocene, the new geological age of human-induced planetary changes (Zalasiewicz, Williams, Steffen, & Crutzen, 2010). The study investigated the location, nature and type of sustainability initiatives in the Gippsland region of Victoria, Australia. The purpose of the study was to trial the development of a place-based survey questionnaire to map initiatives in education for sustainability across a region in order to understand how they emerge in local places. The data from the survey was interpreted using a combination of quantitative and qualitative approaches. This article focuses on the qualitative thematic analysis across all survey responses and assesses the findings in order to determine the usefulness of the approach. The study found that a regional place-based approach enables a different conceptualisation of the possibilities of a cross-sectoral interconnected system of sustainability education. The nonformal and informal sectors are important sites of innovation and have great potential to enrich the pedagogies of education for sustainability in the formal sector.

The study on which this article is based is part of a larger program of research about place-based sustainability education for the Anthropocene, proposed to identify the current era of human-induced changes to planetary processes. In using this term in response to the intensification of global climate change (IPCC, 2007), social scientists identify the need for new ways of thinking and knowing, and for innovative forms of action. Formal, nonformal and informal education have a potentially crucial role to play (Kagawa & Selby, 2010, p. 5) but at present, however, 'there is little evidence of new concepts of sustainability in Australian syllabuses' (Skamp, 2010, p. 10), or indeed elsewhere (Nolet, 2009). Innovative local initiatives are arising outside of formal education but they are isolated from each other and absent from current theoretical formulations.

As teacher educator/researchers we became interested in the increasing community activity in relation to sustainability initiatives in our region, but the comparative absence in the schools in which our students were placed for practicum. We assumed from

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our personal experience that the community place-based sustainability initiatives were educative, but we did not know. We wanted to find out how these different initiatives and systems worked in relation to thinking spatially and regionally.

We were also involved in two regional networks, one of which generated the newly formed United Nations Regional Centre of Expertise in Education for Sustainable Development. The purpose of the regional centres of expertise (RCEs) is to connect local initiatives across a region and then to a global network of regional linkages. Could this framework potentially provide a way to move beyond the habitual erasure of local, embodied, and place-based knowledge in Western education systems? A system that builds up from a base of local knowledges potentially maintains and fosters connection to local places. In order to investigate the location, nature and type of sustainability initiatives in our region, we developed a mapping survey in collaboration with local sustainability and climate change networks.

A regional study of such initiatives potentially offers a place-based analysis on a scale at which sustainability initiatives are meaningful. This article summarises the qualitative analysis of the pilot study in order to assess the usefulness of the approach for thinking through some of the issues raised above. The immediate practical aim of the study was to understand how to connect individual local initiatives to each other across a region in order to gain greater momentum for transformational change. A second aim was to consider how to better link community place-based sustainability initiatives to formal educational curricula and pedagogies. If the results of the survey inform both of these aims then the innovative approach can be assessed as worthwhile.

Research Literature in Sustainability and Mapping

As part of the study we considered the extensive body of sustainability literature that highlights sustainability in formal, informal and nonformal contexts, including schools and the broader community. There appears to be widespread agreement that sustainability represents an ideal that will be achieved when human-caused environmental degradation has been reversed, along with overconsumption and gross economic injustices that deprive future generations of the ability to meet their needs (Nolet, 2009; Orr, 2009; Shiva, 1992; Sterling, 2007; UNESCO, 2002, 2012). This notion was taken up in Sterling's (2001) influential report, *Sustainable Education: Re-visioning Learning and Change*, which advocated for sustainability as a new paradigm 'that makes learning towards sustainable living an explicit, central and integrating concept in education planning and practice' (p. 83). More recently, others (Fawcett, Bell, & Russell, 2002; Henderson & Tilbury, 2004; Onwueme & Borsari, 2007; Tilbury & Wortman, 2008), including Sterling (2012) promote sustainability education for a reorientation of society that equips citizens with critical thinking and problem solving, participatory decision-making and systemic thinking skills to address today's complex sustainability issues.

Such extensive interpretations confirm sustainability as a broad and ambiguous construct, which creates significant implication for how it is interpreted, developed and implemented (Walshe, 2008). There are very few empirical studies to support the implementation of sustainability initiatives and those that do exist offer only very limited empirical data (Somerville & Green, 2011). Despite these challenges, community-based sustainability projects, local communities and their schools are advancing broader community education and action around issues of sustainability (Day Langhout, Rappaport, & Simmons, 2002; Flowers & Chodkiewicz, 2009; Stocker & Barnett, 1998; Tilbury & Wortman, 2008; Uzzell, 1999; Walter, 2012; Zachariou & Symeou, 2008). These actions that promote participation and partnerships provide a critical platform for our own

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understanding of how education for sustainability in local communities across a region is mobilised.

Mapping as a Method

Given the limited empirical research on the mapping of community-based sustainability initiatives we turned to the broader research literature to understand the wider implications of 'mapping' as a research method. Throughout the empirical literature, digital mapping methods have been used extensively in the physical sciences, particularly for gauging current human-environmental phenomena and for future projections. Such examples include the investigation of global environmental issues (Idrizi, Meha, Nikolli, & Kabashi, 2012), calculations on the global costs of fishing (Lam, Sumalia, Dyck, Pauly, & Watson, 2011; Stewart et al., 2010) and other food security issues (Matsumura et al., 2009), the preservation of global forests (Potapov et al., 2008; Wulder, White, Magnussen, & McDonald, 2007), as well as the effects of climate change and water availability (McDonald et al., 2011). These and other studies that mapped ecological sustainability via a process of global mapping (Sutton, Anderson, Tuttle, & Morse, 2012) are of great interest to our work as they each, in their own distinctive way, set out to develop new methods for measuring anthropogenic environmental impact. Despite the science-focused nature of the studies, each reflects mapping as an inherently powerful visual tool with the capacity to predict and understand current/future and local/global sustainability issues. Not only are these studies helpful for valuing mapping as method, they have assisted us in locating our own work within a broader body of work that currently examines human/more than human world relations with sustainability in mind.

Thinking Regionally

The main methodological innovation of our study was to develop a survey using the conceptual framework of place to investigate sustainability education. The conceptual framework of place was operationalised using the concept of place as bio-region. A bioregion is a distinct socio-ecological unit of analysis as an area of land and/or water whose limits are defined by 'the geographical distribution of biophysical attributes, ecological systems and human communities' (Brunckhorst, 2000, p. 37). It is commonly used as the basis for theory development in disciplines such as ecology and natural resource management, but it is rarely used in education. Each bio-region has distinctive eco-social characteristics which will determine the nature of place-based sustainability issues and responses emerging within that region. To examine the characteristics of any particular region, then, is to begin to understand how the organisation of actions towards sustainability is educative, and how those actions arise within particular local place constellations. We illustrate the potential of thinking regionally in taking up the concept of bio-region in relation to the Gippsland region in Victoria, Australia.

Gippsland is a distinctive region in south-eastern Victoria, Australia, which has, like all regions, a particular identity, and identifiable sustainability and climate change challenges. The Gippsland region is 41,538 square kilometres (slightly smaller than Denmark), which represents 18% of the Victorian land mass. Most (60%) of the region's population of 266,718 live in the major centres and surrounding towns, with the remaining 40% of the population in small villages and settlements (<500 people; State Government of Victoria, 2008). Divided into six local government areas, Gippsland is home to some of Victoria's most diverse natural resources and biodiversity. The region was the traditional home of the Aboriginal peoples of the Gunnai/Kurnai language group whose knowledge of language and country is important for eco-social sustainability today. Gunnai/Kurnai people similarly divided the region into five clans areas corresponding to north, south, east, west, and fire country, each having

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distinctive eco-systems: Brayukaloong (west), Brabiraloong (north), Krowatungaloong (east), Bratowaloong (south), and Tatungaloong (fire country) (Thorpe, 2011, p. 9).

Gippsland is also noteworthy, in the context of sustainability, as the provider of 85% of the state's electricity through brown coal-fired power generators. There is concern that the economic viability of the region is threatened by a carbon-constrained future, a concern that arises from the experience of the 1990s when the privatisation and automation of the power industry saw the loss of 8,000 direct, and a further estimated 8,000 indirect, jobs in the region. A once proud storyline of working class labour became a storyline of poverty, with intergenerational unemployment, further pathologised by representations of the region as the source of carbon emissions and global warming. These intertwined social, environmental and economic factors have given rise to a high level of community awareness, concern, and willingness to take action in relation to climate change and other issues of sustainability. The extent to which these actions are educative and what they might mean in terms of a place-based bio-regional approach to sustainability education is the focus of the analysis that follows.

Methodology and (Evolving) Methods

Place-Based Sustainability Survey

Within the conceptual framework of place, a place-based survey was developed in collaboration with the Gippsland Climate Change Network[1] to identify the location, nature and type of sustainability initiatives across the region. The survey asked participants whether they offer sustainability education or activities, what forms they take, what are their goals, how are they funded, whether they are ongoing programs or one-off projects, and who is involved. Respondents were also asked to write a paragraph describing their sustainability initiative in more detail if they wished to volunteer for further in-depth participatory ethnographic study. The survey was sent to formal, nonformal and informal education providers through the Gippsland Education for Sustainability and the Gippsland Climate Change networks. Formal providers included early childhood centres, schools, adult and community education centres. Nonformal providers included regional art galleries, museums, heritage and cultural centres, and national parks interpretative centres. Informal providers include groups such as field naturalist clubs and Landcare[2] groups.

A total of approximately 200 surveys were distributed to schools and community-based organisations through community networks, government school regional intranet email, and Catholic school regional directories. Completed survey responses from the community sector were received without prompting and one follow-up email was sent out after 6 weeks. In contrast, no school surveys were returned from the government school intranet mail out during the first 6 weeks post survey distribution. Contact with randomly selected Gippsland government primary schools via telephone confirmed these schools had not noticed the survey within the DEECD (government schools department) bulk email distribution. In response to this, a number of schools were contacted directly. This allowed us to talk with principals about the study and email surveys directly to those who were interested in participating.

Despite the expressed interest and assurances of the schools we contacted that they wished to complete the survey, there was a continuing lack of survey response from the government school sector, so we decided to vary our approach and make direct contact with more schools. Conversations with school principals revealed the challenges of extreme time pressure with increasing teaching responsibilities and administrative tasks. As a result we decided to focus our efforts on gaining an even geographical distribution of survey responses across the six Gippsland shires through direct contact. Many of the schools reported that they did not have any sustainability education in their schools,

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but by the end of the data collection period we had received 52 returns (21 schools and 31 community/private organisations), which enabled us to undertake data analysis. It seemed that direct contact through established informal networks, or by establishing some degree of relationship, was required to elicit a response.

In the process of implementing the survey we further developed the place-based approach in order to gain a visual overview of the geographical distribution of completed surveys across the six local government areas of Gippsland. We did this by placing coloured pins on the three maps representing government school, Catholic school, and community sector responses that had provided evidence of sustainability initiatives. In studying the maps we were able to ascertain how many participants in a particular location had been contacted and to identify the particular local area in which they were located. This enabled us to target our direct contact to schools and community organisations in the areas that had not been covered. These methodological maps provided a detailed geographical overview of where we had gained positive responses to the survey and therefore the distribution of sustainability initiatives across the region.

Analysis of Survey Data

The process of data analysis was carried out in three phases. The first phase provided a numerical summary of survey responses to the different questions. The second phase involved a summary storyline analysis of selected individual responses and in the third phase we analysed the data using a collective storyline approach. Together the three forms of analysis provided a comprehensive overview of the responses to the survey questionnaire.

In focusing on the qualitative collective response, it is important to note just one aspect of the numerical analysis. In response to the question about the goals of their sustainability initiatives almost all respondents indicated education as one of their goals. This confirmed our original assumption that the majority of sustainability initiatives are educative in intent even if there is no explicit educational purpose. In this sense the following themes that emerged from the collective analysis are storylines of the nature of place-based sustainability education.

Storyline Analysis

We identified emergent themes that cut across the diversity of individual survey responses and then grouped responses under the relevant categories. The following themes emerged to frame the storyline analysis:

- Region-based spatial framework
- Place-based focus
- Philosophical foundations
- Scarcity of funding and resources
- Partnerships
- Innovative approaches to teaching and learning.

Overarching Storyline: Region-Based Spatial Analysis

As previously noted, the Gippsland region is divided into six local government areas. While they do not correspond directly to the division into five clan areas of the Gunnai/Kurnai people, they do share some similarities as eco-social units of analysis and the foci of place-based sustainability education and governance. Considering the relationship between local government areas and Gunnai/Kurnai clan divisions provided important insights into the nature and potential of place-based sustainability education initiatives as a bio-regional system.

Each of the shire councils that are responsible for these local government areas has developed sustainability strategies in relation to the particular characteristics of their

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locality. Latrobe City Shire, for example, has a strong focus on climate change and the economic implications of the transition to a low carbon emissions future in an area whose main identity and economic base is brown coal fired power generation. The Baw Baw Shire Council approach is about community transition to a sustainable future in a locality characterised by small farms, alternative food production and the most progressive, wide-ranging, place-based sustainability initiatives. East Gippsland, a large, isolated and sparsely populated area with a range of diverse natural landscapes, has a strong focus on environmental sustainability. While local councils potentially provide a basic eco-social unit as a hub for sustainability education, they are poorly resourced for this work and it is unclear from the survey whether their excellent sustainability strategies can be translated into practice.

The eco-spatial sustainability thinking generated by this category of region-based spatial analysis enabled the bringing together of Australian Indigenous frameworks and non-indigenous spatial and governance structures of local government. This then generated a new overarching storyline within which the following thematic categories can be analysed and interpreted.

Place-Based Focus for Sustainability Education

A place-based focus refers to sustainability education that is grounded in the nature of the locality in which it occurs. Throughout the surveys a number of outdoor places such as school grounds and community gardens, wetlands, forests and creeks were identified as critical sites for the delivery of place-based sustainability education. For school children this meant collaborating in teams, and frequently leaving the school itself to engage in activities in the field or community. Local places provided the framework for projects that were linked to local ecologies, biodiversity and sustainability.

More than half the schools in this study established food gardens as part of teaching sustainability. One gardening teacher described how students 'take records of different things that are happening [in the garden], for example, egg production, the changing of the season with fruit trees', characteristics determined by the weather, seasons, rainfall and soil fertility of particular landscapes. Another indicated how 'sensory engagement' in these everyday places heightened children's awareness of 'what's happening around them such as weather, song of birds, frogs'. Some schools extended their gardening work into the public sphere to educate their wider communities about sustainable gardening principles and practices, as explained by the principal: 'We have had local organisations come and view our garden as part of sustainable gardening workshops, which have been organised throughout the year.' Such links connected children to the groups that formed from the histories and geographies of that particular location.

Direct links between community gardens and sustainability were also highlighted in the survey data. Many community gardens operated as a means that educate local people about growing food, reskilling people in traditional food production, and linking communities to local food systems. This trend was particularly prevalent in the more affluent West Gippsland, which is closer to the city of Melbourne. Respondents described how community gardens became hubs that 'encouraged people how to grow produce organically … to learn about design, organic pest control, composting and biodiversity'. Community gardens have become recognised as important places where people barter, share and sell food.

The place-based approaches and pedagogies articulated in these survey responses evidence sustainability education that grounded local places at different levels and scales from school and community gardens to forest protection, and advocating at a political level about the significance of forests in the carbon cycle. They are connected to the materiality of local landscapes and their historical and geographical emergence

as eco-social units. To consider these as parts of an eco-social system of sustainability education within a region-based approach enables the potential to leverage momentum towards transformational change.

Philosophical Foundations

Many of the sustainability initiatives described by survey respondents are underpinned by deep philosophical values. One school explained the pedagogical meaning of their work:

> *To educate students in the understanding and conservation and the importance of caring for our natural environment … we want students to understand global food issues such as poverty, food security, food miles, ethical food, sustainable living and connect these issues to the development of a school vegie garden.*

The intention of addressing these deeper levels of engagement and understanding of sustainability requires students to connect the context of their personal lives (local) to the national and universal perspectives (global) that inform sustainability across the world. This 'belief in sustaining future communities' was the rationale behind two (school) principals' descriptions of students' volunteer work in the broader community. Some of the key goals for another school whose senior students undertake community-based work as part of a school curriculum was to 'link young people with the broader community; develop individual and group responsibility; nurture self confidence and resilience; ingrain values of integrity, enterprise and excellence and development of active citizenship'.

Religious schools and organisations tended towards a larger and more philosophical vision of integrated sustainability practice. A well-established Anglican not-for-profit private organisation, for example, is currently developing philosophy and policy around long-term organisation-wide sustainability practices incorporated in training and recruitment. Employees (including clientele such as families/children) receive explicit messages about the agency's commitment to responsible environmental and social practices.

The philosophical dimension of sustainability initiatives enables the inclusion of deeper and more existential questions and considerations than the simply cognitive. For these respondents, the knowledge, learning, language, and practices of sustainability are tied to deeper philosophical questions of existence such as those asked in Rautio's research in the rural north of Finland: 'What is a good enough life?' and 'What makes our everyday life beautiful' (Rautio, 2011)? These questions are fundamentally ethical and aesthetic and concern our relationship with the fabric of the earth and the more-than-human world.

Lack of Funding and Resources

The lack of funding and resources were significant themes across the sectors. Despite the majority of respondents expressing a preference for long-term enduring programs of sustainability education and action, survey responses suggested that initiatives tended to be project- rather than program-based due to funding and resource limitations. Project-based funding tended to limit the possibilities and longevity of sustainability initiatives due to the short-term and limited nature of funding as suggested by one respondent: 'The group aims to be long term but projects are very short term given it is nearly all coordinated and delivered by volunteers. Outcomes are generally not assessed as the group does not have resources to do this.' The issue of continued funding for programs was problematic at all levels: comments such as 'funding is always an

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ongoing issue' and 'the funding will run out' encapsulated a collective sentiment amongst many of the respondents.

Local governments expressed their own reliance on project funds and in-kind support from community, who in turn depend on the shire councils in a perpetual cycle of underfunding. This is particularly the case for Landcare projects that depend on reciprocal relationships with the broader community and schools. Local governments are logical providers of support for community-based sustainability education, but it appears that they are not necessarily funded to do this. Community groups and schools are heavily reliant on scarce human resources such as volunteers and parents for labour and creative ideas. Our analysis suggests that volunteers tend to prop up the majority of sustainability initiatives, including the formal education sector.

The lack of funding and resources for sustainability initiatives raises the question of how to support such activities in an enduring way in a system with no more resources to give. In following the storyline of eco-spatial regional thinking, resources need to be sourced and allocated in local government areas. The work of looking after the planet needs to be valued differently and the partnerships and collaborations through which leverage can be gained towards momentum for transformational change are critical in this work.

Partnerships

The majority of surveys made reference to the important role of partnerships for the effective delivery and longevity of sustainability education programs. Partnerships were essential for community-based groups and schools operating with limited funds, and tended to cross all dimensions of Gippsland communities. They were made up of collaborations across schools, community volunteers, local governments, local business, government departments, water and catchment management authorities, universities, community banks, wetland centres, civic associations, philanthropic foundations and trusts, conservation societies, museums, health care providers, farming groups, rural women's groups, and students and learners at all levels. Partnerships were especially relevant to the more isolated communities such as East Gippsland where groups deliberately sought strong enduring collaborations with existing organisations.

Surveys indicated the significance of Landcare partnerships and grants that generated opportunities for schools and communities to collaborate on local habitat projects. The Koala Corridor project exemplifies how schools and communities work in partnerships towards the revegetation and preservation of local bushland. Such projects are quintessentially local, as with the Strzelecki koala, a particular species of koala that lives on a small variety of eucalyptus trees that grow in the Strzelecki Ranges, a mountain range that borders West and South Gippsland shires. To grow a koala corridor is to know the way areas of bushland link to each other in a locality, the types of eucalypts the koalas eat and their growing habits and conditions, the sourcing of seeds to raise, and the seasons of planting and growth. This kind of knowledge lives in local communities and partnerships with community organisations are necessary for it to enter the curriculum and pedagogies of school education.

Funding, resources and partnerships need to be considered together in terms of new and alternative economies and new ways of organising social and institutional structures of work and community. Relationships, and the necessity of working together, like the organisation of Indigenous kinship structures that are tied to country, are crucial resources for a sustainable future. Sustainability education in the formal sector will need to include both education and practice in sustainability partnerships that bring the next generation into the learning that is needed for planetary work.

Innovative Approaches to Teaching and Learning

Respondents identified a number of sustainability initiatives that they considered innovative including:

- the development of local food networks and small farm workshops
- solar power to generate more than enough power for their own use
- sustainability festivals across many local shires
- 'follow your waste' tours, with 12 primary schools teaching children about sustainability with recycling, reuse, recovery, and composting
- a sustainable house day that attracted hundreds of people to homes in the area
- community and Indigenous groups participating in land and waterway management and restoration projects
- farms and schooling collaborations
- a Community Wetlands Day that involved local schools, field naturalists and volunteers
- mapping inundation data with a range of stakeholders
- teaching community spirit through sharing excess produce
- Early Childhood conferences open to all Early Years' professionals, families and the wider community, with an emphasis on sustaining the workforce and sustainability.

The nature of the innovations listed above need to be conceptualised within the whole trajectory of the new storyline of country presented in this analysis. They can be imagined as local place sites, with different activities, partners and stories connected to each other across the region in a larger storyline of regional sustainability action and education. Each of the innovations is a site for further research to more deeply analyse the nature of the pedagogies that are being developed in these alternative learning spaces. They typically involve place- and community-based experiential approaches, including experimentation with the latest sustainable technologies, as well as enduring intimate relationships with local places and people. These embodied approaches to sustainability are an important beginning point to understanding the possibilities of a connected system. Further in-depth study is being conducted to analyse the nature of the curriculum and pedagogies to enable the integration of sustainability into formal education.

Conclusion

Our preliminary observations suggested that the most exciting and innovative sustainability education initiatives are emerging at grassroots community level, but do not appear in the formal curriculum of school education. These initiatives, however, seemed to be dispersed and lack the momentum for transformational change. New networks are also emerging, however, to address this fragmentation, including the Gippsland Climate Change Network and the Gippsland Education for Sustainability Network, with whom we collaborated to design and conduct the survey. Part of the purpose and work of the networks is to understand what is going on across the region, and therefore how to better facilitate sustainability action and education. The place-based survey was designed as an open-ended questionnaire to explore how to access and analyse these diverse cross-sectoral activities and their spatial relationship to the material landscapes of the region. The development of preliminary visual mapping techniques proved useful and could be extended using Google maps to further enhance connection between disparate local initiatives in order to leverage greater momentum for change.

The responses from local government sustainability officers drew our attention to important strategic plans for sustainability developed within each local government area that were quite different from each other, depending on the sustainability challenges of each location. Mapping the shape of local government areas revealed the

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division of the region into similar scale eco-social units to the division of country for Gunnai/Kurnai people who traditionally occupied the region and continue to revitalise their culture and language there today. This finding supported the usefulness of a regional approach to framing a place-based system of sustainability education and action that draws on Aboriginal eco-social structures and thinking.

While the characteristics of the Gippsland region are specific, the process of mapping the intertwined socio-cultural, environmental and economic issues is a generalisable one in relation to understanding how education for sustainability works as a system across a region.

This place-based approach to mapping sustainability initiatives offers a unique perspective on the crucial nature of developing interrelated networks of regionally organised education for sustainability. It brings together a systems approach that tends to be abstract and highly conceptual with a place-based approach to provide the crucial link to the materiality of local places in sustainability education.

Conceptualised within this framework, it is possible to identify the contributions of formal, nonformal and informal sustainability actions and education. The innovative place-based pedagogies of nonformal and informal provision are understood as educative even though not articulated in the same way as formal education. The nature of their place-based sustainability education enables insight into their potential for enriching formal education. They typically involve place- and community-based experiential pedagogies shaped within and by the communities and places in which they arise. Strong and enduring approaches were underpinned by deeper philosophical questions around the existential meanings of sustainability action and education. Further research is required to articulate the nature of these local, embodied community pedagogies of sustainability and their important contribution to the possibilities of an interconnected system.

The overriding storyline of education for sustainability considered as a cross-sectoral system is the extreme lack of funding and resources in all parts of the system. While local government has excellent place-based sustainability strategic plans, they rely on community volunteers to carry out their projects. Sustainability initiatives are indeed emerging at grassroots community level, but they in turn rely on minimal, short-term, project-based funding and volunteers. Interestingly, we found a similar story in the school system where the rare exemplars of integrated sustainability education relied on partnerships, volunteer support and the dedication of particular visionary teachers to contribute over and above their normal teaching work. Formal education structures, however, are enduring and an important site for the embedding of sustainability education.

Within this extreme resource-constrained system there were some outstanding examples of creatively overcoming the constraints of a capitalist economic system that can only value growth and material wealth. The importance of partnerships, networks, and community emerged as key responses to building capacity for sustainability education considered as a regional system. This emphasised the component of learning how to do partnerships and form community as an integral part of sustainability education. Community grassroots sustainability initiatives are a crucial site of this learning and innovation. They are not only doing the work of undertaking sustainability education and forming community, but they are necessary to support the integration of sustainability into formal education. Finally, we identified that as the most significant resource in the system is human capacity, then the provision of professional learning for educators who work within all sectors of formal, nonformal and informal education is fundamental to the support of regional systems of sustainability education.

Notes

[1] The Gippsland Climate Change Network Inc. (GCCN) is an incorporated not-for-profit network of approximately 50 diverse member organisations across government departments and agencies, private businesses, community groups and other organisations, covering the six local government areas across the greater Gippsland region.

[2] Landcare is an Australian grass roots movement that harnesses individuals and groups under the ethic of caring for private and public land. The movement has a broad focus on sustainable management of Australia's natural resource assets and covers coastal, urban, rural and remote Australian landscapes.

Keywords: sustainability, education, mapping, place and community

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Margaret Somerville is Professor of Education and Director of the Centre for Educational Research at the University of Western Sydney. She has a long history of empirical research in place-based education and decolonising methodologies using creative and alternative approaches. Her latest book, arising from her long-term collaboration with Indigenous artists in the Murray-Darling Basin, *Water in a Dry Land: Learning Through Art and Story*, is published in Routledge's Innovative Ethnography Series in 2013. Most recently her work seeks to understand the systems, pedagogies and learning processes that will lead to transformational change for planetary sustainability.

Dr Monica Green is a Lecturer at Monash University in the Faculty of Education (Gippsland campus). Her current research is centrally focused on pedagogies and curriculum that support education for sustainability, including climate change and the preservation of local places and communities. As a researcher she is interested in the pedagogical potential of everyday places such as school grounds and nearby locations that nurture children's emotional, social, physical and ecological development through embodied learning. Her research has examined the significance of 'place' and place-oriented curriculum as a framework for guiding teaching and learning in unique and local contexts.