

CLIMATE CHANGE IN THE VICTORIAN ALPS: CAN VET BE A CHANGE AGENT?

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Abstract

Of all the factors contributing to turbulent times in Australia, climate change is one that offers both challenges and opportunities for VET. In a time when the response to water availability is subject to 'extensive debate and policy attention', our paper explores what adults living and working in the Alpine region of Victoria understand about the changes to water availability, and what they have learned about adapting to significant climatic changes in their local area. Interviews were conducted in the towns of Bright, Mount Beauty and Albury, with participants from across the Alpine region. Our study found evidence of a strong understanding of the direct impact of climate change on participants' local community area, and a keen desire to learn about adaptation to change. In addition to an identified need for more information around climate change issues and projected impacts in general, participants saw practical hands-on water education strategies as an important way to educate people to help themselves. Conversations about where or how people learned to adapt to change were broad ranging, and clearly connected to the participants' backgrounds, livelihoods or where they were situated. This raised the question of what responses VET might develop to address these identified learning needs. Major local industries of tourism, agriculture, water harvesting and landcare are all covered by national Training Packages that include industry-specific units of competence to support learning to live and work in an environmentally sustainable way. In addition, the national Employability Skills framework offers opportunities to build climate change awareness and adaptation into units of competency where they may not be explicitly incorporated. Our paper will outline the opportunities for VET to act as a change agent in this and other Australian communities impacted by climate change.

Introduction

... I would judge the time of year by how it looked and the last 5 years I have been saying 'my God it looks like February' and we are only in November.

The Alpine Shire is situated in Victoria, about 300 kilometres north east of Melbourne and 70 kilometres south of Albury / Wodonga (ASC 2008). The major townships are Bright, Mount Beauty and Myrtleford, situated in a region that encompasses major ski resorts such as Mount Hotham, Falls Creek, Dinner Plain and Mount Buffalo. The region has a permanent population of approximately 13,000, but with tourism one of the region's major industries this population swells during peak season. While the Alpine region has a vibrant and diverse history and culture, an abundance of water is a significant part of its identity. Located in the Ovens and Kiewa Valleys, the Alpine region is a water harvesting area with the Buffalo Dam (Lake Buffalo), Kiewa Hydro Electric Scheme, and various regulated and unregulated rivers and streams. The

significance of water in the Alpine region lifestyle is reflected in strongly recurring visual images of green grass, autumn trees, heavily forested mountains, snowfields, still water pools and flowing rivers.

In exploring how adults who live and work in this region understand and learn about changes to water availability, the study found evidence of strong understanding within the community of both the direct and indirect impacts of dryness. While the study itself did not focus on VET learning, it revealed opportunities for VET to support learning about and adapting to dryness at a local community level and in the key industry sectors of water harvesting, tourism, land management and agriculture.

Literature review

While there is little dispute that increased temperatures, reduced rainfall and dryness have become issues of concern throughout the Australian community, the literature variously represents these as issues of 'climate change' (cf Department of Climate Change 2008; Hennessy et. al. 2003), 'drought' (cf Blackadder 2005; DPERSP 2008), and 'water availability' (cf CSIRO 2008a). In the research design for this project a decision was made to avoid presuppositions about causality (Golding & Campbell 2009, p.427), focusing instead on the uncontested experience of 'dryness' and the learning issues that are associated with adaptation to increasing dryness.

The literature revealed numerous references to dryness and adaptation at government, organisational, community and individual level throughout Australia (Blackadder 2005; DPERSP 2008; PMSEIC IWG 2007) and specifically relating to the Victorian Alps (cf CSIRO 2008b). CSIRO research (CSIRO 2008b; State Government of Victoria 2008) documented historical and recent data on climate, development and water use, and modelled various projections for the future. According to that research, Australian droughts have become more severe in the last 30 years, and based on projections for warmer temperatures and reduced rainfall the risk of drought is predicted to increase by between 10% and 80% in southern Victoria and between 10% and 60% in northern Victoria by 2070 (State Government of Victoria 2008). With reference to the Alpine region, CSIRO modelled three different projections for 2030: a 'best estimate' projection, a 'wet extreme' projection and a 'dry extreme' projection (CSIRO 2008b, p.4). Under the 'best estimate' projection for 2030 water availability in the Alpine region would be reduced but with only a 'negligible impact' on surface water use. Under the 'wet extreme' projection, water availability would be expected to increase slightly, and the 'dry extreme' projection would see water availability reduced by 45%, with more frequent water restrictions in townships (p.4).

The primary focus of the *Learning to be Drier* research project was how adults living in communities affected by such changes learn about and adapt to those changes. This adaptation is described in the literature as a process of adjusting to the impacts of climate change in such a way as to reduce the magnitude of the consequences experienced (Berkhout et al. 2006, p.135; Preston & Jones 2006). Berkhout et al. (2006) argued that 'before change can be initiated, a signal needs to be recognised as evidence of a novel situation, in response to which existing routines are inappropriate or ineffective' (p.138). Berkhout et al. reported that organisations tend to resist conclusions that challenge established frames of reference, 'often in the face of considerable counter-evidence' (p.138). This raises the question of whether the

experience of dryness in the Alpine region represents a 'novel situation' to which established water use would be seen as an inappropriate or ineffective response.

Research method

This paper reports on one component of a collaborative research project conducted in 2009 by a team of researchers from Deakin University and the University of Ballarat. Overall the research project explored issues of dryness and adult learning in four 'highly water-dependent communities' in the Murray-Darling Basin (Golding and Campbell 2009). This paper focuses on the Alpine region of Victoria.

While the fieldwork was conducted in the Alpine townships of Bright, Mount Beauty and the regional city of Albury, the focus of the study extended beyond these towns. The researchers initially visited the Alpine region in mid-April, in a reconnaissance visit that involved travelling through and experiencing the region, meeting local people to introduce ourselves and the project, and inviting their participation. Most people we spoke to expressed keen interest in being involved in the project, and referred us to other members of the community who they felt would also be interested. The second visit took place in late May, with focus group and individual interviews conducted over a two day period involving interviewees from across the Alpine region and representing different roles and interests. The stakeholder groups participating in the fieldwork included adult educators, local authorities, community members, members of the local fire brigade, business owners, farmers, retirees, members of the University of the Third Age, and other community interest groups. Fieldwork confirmed that the principal provider of adult education programs was a community based Neighbourhood Centre that was well respected by members of the community. Other VET options were dependent on RTOs providing services from bases as remote as Albury-Wodonga, Melbourne, and even interstate.

The fieldwork explored what participants understood about water availability in the Alpine region, and what and how they had learned about living with and adapting to dryness. The discussions were audio-recorded with the participants' consent, and the transcript data was used to generate participant narratives in which local people tell their own stories based on personal experiences of learning about and adapting to dryness in their environment. In presenting extracts from the accounts, it has not been possible to attach particular role identities to individual accounts, as many participants spoke from the perspectives of the multiple roles they fill in their community; for example, a farmer might also be involved in the fire brigade, or a business owner might also be involved in committees through a local shire or water authority.

Findings and discussion

Interview data clearly revealed that participants in this study were aware of increasing dryness impacting on their community, and were keen to discuss strategies to learn about that dryness and how to adapt to it. This awareness was evident both at local community level and also in relation to the major local industries of water harvesting, tourism, land management and agriculture. With a range of VET qualifications addressing environmental sustainability, the data suggests significant opportunities for VET to champion sustainable practice through community or industry based training.

Water awareness and adaptation at community level

In comparison to the other sites included in the *Learning to be Drier* study, the immediate and direct impact of dryness on the Alpine community might appear to be less severe (Foley & Grace 2009). Interviews conducted in the western Riverina of NSW (Golding & Angwin 2009), the South Australian Riverland (Brown & Schulz 2009) the northern Wimmera and Southern Mallee dryland region (Smith & Campbell 2009) revealed communities which had already experienced significantly reduced water allocations and severe water restrictions. In contrast, interviewees in the Alpine region described water availability as 'pretty good' and 'excellent'.

... there's water flowing, it's quite impressive when you compare it to some other places.

Water availability was reflected in typical summer water restrictions at Stage 1 and 2, only moving to higher levels when bushfires contaminated the water supply:

Last summer we got to Stage 2 restrictions and we didn't get much past that, the restrictions there are no watering of your lawns and watering your garden on alternate days basically.

During the fires we went to Stage 4 a couple of times but that was only because the soot and rubbish was coming down the water supply

Interview data suggested that some community members perceive that water restrictions in the Alpine region were unnecessary.

Well I know when they brought in water restrictions, the people that I spoke to in town thought it was a bit of a joke like 'why do we have to have water restrictions' because we have got so much water, so I think that there is that misconception that we are at the head of the river and we have got all that water so why should we have water restrictions.

Other interview data clearly revealed awareness of the need to conserve water.

Well they have got an attitude ... there really isn't any need for water restrictions... The dams up there are full now and they will fill up again in the winter with the snow, but the storage areas are dry, so we are only just getting enough to get by. I think that is what a lot of people don't know and if they knew that in the future storages are drying out and eventually the dams are going to go down then they might think a bit differently.

Participants described water saving strategies they had adopted, including water tanks, shorter showers, using bore water, limiting watering to evening and morning, recycling grey water, low water use irrigation systems, and mulching gardens.

We are at the point where we use the water from the washing machine three times before you put new water into the machine so we pump it back through so that there is enough water to go around.

Some participants appeared relaxed about the prospect of their lawns dying off through not being watered in summer, although there was concern about trees dying:

I don't water what I call the lawn, most people call it grass. ... If it dies in summer that's beaut you don't have to keep mowing it so I score from that.

I don't want to be wasting water if I can help it; apart from the silver birches I water the grass around them.

While others publicly signalled their use of alternative water supplies.

... it's interesting that people are putting out notices... to say 'bore water in use', so if they have got a nice garden there is often a sign 'bore water' or 'recycled water' so they are letting the neighbours know.

Water awareness and adaptation at industry level

The major Alpine industry sectors considered by this study were water harvesting, tourism, land management and agriculture. Interview data confirmed indications from the literature that each of these industries had experienced the impact of dryness. The NTIS confirms that each of these industries is covered by a Training Package that offers a framework for the development of sustainable responses to increased dryness.

As a water harvesting area, the region is highly dependent on rainfall and snowmelt:

... we rely heavily on the flow of water in the rivers ... in terms of the water use for most of the people in our area there is no dam as such it is just relying on what's coming down the river. There is no real winter storage.

[Summer water restrictions] relate to the amount of water flowing down the Ovens ... in some years... it can be a good thing you can get enough water and we don't need to go on to restrictions, other years when you don't have those periods of rainfall and it can really go right down and then you are forced to go up to fairly high restrictions right away.

Tourism is impacted by increased dryness throughout the year. During winter tourists are attracted to the region to visit the snowfields; during summer tourists visit the high country and other attractions. CSIRO research projected reduced snow cover including a rise in the natural snowline, a reduction in the duration of the ski season, and a reduction in the depth of snow, making increased use of artificial snow-making necessary (Hennessy et al. 2003). Community awareness of projected changes was reflected in informal discussions that took place during the reconnaissance visit in April, and the projections have clear implications for winter tourism. Data from focus groups and interviews revealed the impact of dryness on the summer tourist season.

... when the river is low it is such a draw card for our towns and people notice ... if people come up from Melbourne or other areas they like to see greenery and like to relax so there are still those expectations that we should water our key parks. ... so we have in the past chosen a couple of key parks ... and we maintain water onto those areas

... our major tourist time is summer which is when the river flows at its slowest so you have got like two competing demands there.

Management of the Alpine and Mount Buffalo National Parks makes land management another important industry in the Alpine region. The literature projected significant impacts on biodiversity of flora and fauna in the Alpine national parks (Hennessy et al. 2003; Williams et al. 2008), with dryness contributing to increased frequency and severity of bushfires, with resultant impacts on native trees, alpine bogs, and the spread of exotic weed species. Interview data revealed that people

working in land management roles are aware of the threat to biodiversity, and have implemented a range of programs in response.

... the trees are under a great deal of stress because we had two fires in fairly close proximity [2003 and 2006] and drought on top of that and the natives are really struggling. ... The mountain ash that you see in the higher elevations, they rely on fire to germinate their seeds. The intensity killed off all the mature trees and germinated the small ones but if another fire comes through and kills off the smaller ones there is just not that seed back to germinate.

Green Core run 6 months program for youths aged 17-20 so we have had them doing a few projects ... mainly focusing on willow removal and blackberry removal and re-vegetation ..., but they also do water quality testing as well. ... so that's working with Parks Victoria and DSE¹ and Catchment Management Authorities, so bringing all those resources together.

As with other industries, agriculture has experienced the impact of dryness since around 2006 when restrictions were introduced on pumping water from the rivers, limiting farmers to their water allocations. Irrigation in the Alpine region is used for crops, pasture, grain, vineyards, tea, hops, and pepper growing. Interview data revealed clear evidence that the farming community is aware of the impact of dryness.

... the creeks are drying up ... there was a place up Mountain Creek had a swamp and now it's a drain in the last three years

The groundwater hasn't changed much ... the surface water has definitely decreased in the last 20 years.

Some interviewees described individual farmers 'wasting' water by using bore water to irrigate during the heat of the day.

There are still a couple of them up the valley that do that and you have got all these brown patches and then you have got this green one and he's pumping away in the middle of the day and you think how stupid.

The data suggests that irresponsible water use is unusual, with farming communities adopting a range of water saving strategies such as recycling grey water, and installing water tanks and water-saving irrigation systems. Some farmers had installed additional dams and bores to provide an emergency water supply for fire fighting. But adaptation options are seen to be limited. Where farmers used to cut hay twice a year now they are only able to cut once, and they have to buy in hay to feed their stock. For some, the only 'adaptation' option has been to leave the farm altogether.

Quite a few of them have packed up and moved into the city because it is not working, we can't have the cows, we have to have water and we can't grow the grass because we can't irrigate so people are moving out.

Learning strategies and opportunities for VET

The focus of this study was on how adults living in communities affected by dryness learn about and adapt to changing conditions. While opportunities clearly exist for VET to play a significant role, interview data suggests that community members and industry participants alike rely on informal sources such as word of mouth and local

¹ The Victorian Government Department of Sustainability and Environment

community groups, rather than formal education programs. The Alpine Shire issues newsletters and community information to:

... showcase some things that Council are doing to save water which then flows on to what people can do at home.

North East Water, the local water authority, employs teachers as education officers.

We have an in-schools community education officer and she works across our delivery area with students, but also with teachers in terms of curriculum. We work with other organizations such as the Catchment Management Authority, Local Government, through ... an environmental program of which a big chunk is water, so that's around curriculum development as well.

Some community members drew on experiences of growing up without town water.

I grew up where we had to pump the water for ourselves, so I grew up with not being allowed to waste water ... and it's just a matter of habit.

Others described water restrictions themselves as a strategy for informing the community about dryness, particularly as restrictions were generally well advertised. While some participants said they had not seen any reports in the local media, others described water availability and water restrictions as a 'hot topic', which 'gets a hell of a lot of media attention' in local papers, radio and TV.

a lot of people find out about these things through water restrictions. They are a very good way to get information out and raise awareness to the community, so you become more aware about what you are using and how much you should be using and what you should be watering and what you shouldn't be

I have no problem finding out what restrictions we should be on and I think anyone who does have a problem must be well switched off because it is out there.

Some participants suggested more government regulations and financial incentives as strategies to encourage people to adapt their behaviour.

It is really getting that information to the community what can be done and I think there are more regulations that can be put in place at a Government level in terms of what requirements you might have in building a new house, particularly in terms of making rainwater tanks mandatory and having them connected to the laundries and the toilets and things like that.

One participant suggested that education programs could start at school level, while another described how a local community learning centre had tried unsuccessfully to provide sessions on water and environmental issues:

... I think because people think it really doesn't affect them then they are not fully into making a change. It's very hard.

Overall, there seemed to be a sense that more education was needed.

I think it is an education thing, I really do, I think people need to be much more aware of where the water actually comes from and what difference does it make if we do things ... like you say 'if I do this, is that going to make a difference?' ... and we don't know, so there's not enough research and there's not enough information out there, so you can't make a valued judgement.

Goldney et. al (2007, p.7) argued that the VET sector 'has a key role to play in promoting sustainability education, both in policy and practice'. Yet the absence of a coherent VET response here suggests that opportunities are being missed. There was little evidence from the data of education programs being explicitly used to raise awareness of dryness or to help inform people's decisions about their own water use.

Each of the industry sectors considered in this study is covered by a Training Package that includes units of competence relating to environmental sustainability, in some cases specifically relating to water use (NTIS n.d.). These Training Packages offer capacity to integrate sustainability and learning about water usage into vocational education and training, either through industry-specific training or by incorporation into educational programs structured around generic or life skills (Goldney et al. 2007, p.7). Beyond the industry training packages, the national Employability Skills framework (Cleary et al. 2006) offers further opportunities to integrate learning relating to sustainability and water use into a range of vocational and community-based programs. In particular, the employability skills of 'Problem Solving', 'Initiative and Enterprise', 'Planning and Organising', 'Learning', and in some areas 'Technology' would be well suited for use in the context of learning for sustainability and environmental issues including water use. There are opportunities here for VET providers to play a key role in raising awareness and fostering sustainable practice.

For these and other VET frameworks to effectively support sustainability education in the Alpine region and other regional areas where communities are confronted by dryness, VET authorities and institutions need to adopt a coherent approach to sustainability education, and they also need to strengthen VET provision in regional Australia. Recent research, however, suggests that both needs might prove in practice to be barriers. Goldney et al. (2007, p.9) noted that in comparison to international practice, the Australian approach to sustainability education lacks coherence. This is attributed to a variety of factors including a lack of understanding of how sustainability education can be incorporated into VET programs, curriculum requirements that have potential to restrict the acceptance of sustainability education by training organisations, and a policy divide between different government agencies with responsibility for VET and for environmental issues. Kearns et al. (2008, p.7) explored VET provision addressing regional development skill needs, and concluded that VET is not being used to its full potential in regional areas. Barriers included tensions between priorities at different levels of government, and a tendency to focus on short-term needs rather than programs to strategically support longer-term skill development and hence support sustainable regional development.

The *Learning to be Drier* study presupposed that adult learning in communities such as the Alpine region would include both accredited vocational education and community-based learning, but that within this range VET programs would likely represent only 'a small sub-set of all learning' (Golding & Campbell 2009, p.426). When adults in the Alpine region were asked about how and what they had learned about dryness and adapting to dryness, VET programs were not mentioned in any interviews or focus groups. This may indicate that VET programs relating to these issues are available, but that the participants in this study had not participated in any such programs. But it may also be an indication that relevant VET programs focusing on sustainability are not available to the community in the Alpine region nor we might suggest in the other regions involved in the study. Whatever the cause of this lack of

participation, or lack of relevance of VET to this community, the problem remains that the social and economic well-being of rural communities is inherently linked to environmental management practices (Pepperdine 2007). Environmental sustainability is one of the main issues facing rural communities today. The future of these rural communities is dependent on effective planning, and education measures that develop environmental sustainability practices and awareness that works to inform and assist rural communities to remain environmentally proactive as climate change continues to impact on our rural communities.

Conclusions

This paper has argued that community awareness of increased dryness, combined with a keen desire to learn new responses, create an opportunity for VET to play a significant role as a change agent in promoting sustainable water use practices. Industry Training Packages offer opportunities to use industry based training programs to achieve this end, while the national Employability Skills framework offers similar opportunities through community based education programs. Yet there is little evidence in the data taken from our small study to indicate that local community members in the Alpine region are turning to VET for knowledge and training in environmentally sustainable practices. This finding is consistent with other research that suggests that VET does indeed have a key role to play, but that the ability of VET to undertake this role in practice is constrained by a number of factors including a lack of coherence in the approach to sustainability education. It is our contention that it is time for VET to *step up to the plate* in an integrated way to meet the needs of our rural and regional communities as they develop their knowledge base to meet the challenges of climate change across the economic and social fabric of their communities. This would benefit RTOs and the community as a whole.

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