

## Learning to be drier in dryland country

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*This research project, part of a much larger study, considered how people in regional communities learnt to deal with the impact of reduced water availability as a result of drought or climate change. The communities in the Mallee-Wimmera region of Victoria, Australia, were the focus of this study and a range of local people from different sectors of the communities were involved in interviews, which became our main data source. We recognise the limitation that not all viewpoints could possibly be accessed in the participant selection process. The resultant data indicated that significant changes were being made to local practices as a result of the learning taking place and that there were a range of processes which enabled adult learning across the communities.*

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## **Introduction**

This paper looks at learning about living with drier conditions in an area which has always been comparatively dry. The Wimmera-Mallee region, in north-west Victoria, while in the past a productive wheat and sheep agricultural area, has survived over the years without major sources of water apart from rainfall. No large rivers run through the area, although the Murray runs along the northern Mallee northern border. The rivers that exist are intermittent and the 'terminal' lakes are not dependable and increasingly saline. Farmers are therefore dependent largely on seasonal rainfall although there is a stock and domestic system in place that delivers water by channels from the Grampians-Wimmera-Mallee (GMW) water authority, which is now in the process of changing to a piped system as will be explained in the paper. The northern part of the region has significantly lower rainfall than the south, and the drier conditions experienced in the past decade have therefore been a greater change for people in the south of the region.

The research was carried out in the southern part of the Mallee region and northern Wimmera. Here there are four larger towns, each in the order of a thousand people and each separated by about half an hour's driving distance. Each town has a range of basic services: shops, agricultural suppliers, hotels, and secondary school and so on; but with some discernible differences in prosperity and population age structure among the towns, with one (Town B in Table 1) having a larger number of younger families, as reported by respondents. No significant rain had fallen in several years before the research took place (remembrances of the number of years since significant rain varied among respondents); but, both ironically and excitingly, heavy rain fell on the second day of our first visit in April 2009 and reasonable rain continued between then and the second visit in July, at which time the landscape had taken on a completely different aspect, with good rains continuing into Spring 2009.

## **Background and literature review**

The background against which this case study should be viewed can be briefly summarised as follows. Australian farming has undergone a radical transformation in recent decades. A combination of an increasingly global agricultural marketplace and cycles of drought have led to an uncertain outlook for farmers. Family farms are increasingly becoming consolidated in larger holdings, some of which are owned by large companies rather than by individuals. These changes have major impacts for farmers and their families and an increasing trend towards off-farm working for family members (eg Alston, 1995). There has been longstanding concern about the depopulation of many rural communities in Australia as in other countries, due to younger people leaving for further education and jobs and not returning (Gabriel, 2002). Farm mechanisation has led to a decrease in demand for labour on the land itself (John, Pannell & Kingwell 2005; Schulz 2001: 80).

Clearly drought is not the only factor affecting farming regions, but it is extremely important. The Introduction to this special edition covers drought literature in detail so this section is confined to literature specifically about the Wimmera-Mallee area. The Birchip Cropping Group (2008a), a notable Wimmera-Mallee organisation concerned with improving farming practices, undertook an extensive research project about the effects of drought in the region, involving 60 farming families. The major findings were concerned with the uncertainty faced by farming families, the way in which prolonged drought had depleted families' resources, the tendency to adopt conservative farming practices, the worries that communities are irrevocably declining, and the high and continuing levels of anxiety experienced by some farmers. On the more positive side, they also reported farmers' commitment to their occupations and among most farming families a continuing tendency towards optimism (Birchip Cropping Group 2008a). A report by the Youth Affairs Council of

Victoria (YACVic 2008) in partnership with a Wimmera-Mallee organisation, the North Central Local Learning & Employment Network, showed that drought had a particular effect on young people as they had grown up in dry conditions, with the associated stress. Some young people worried about whether they would be able to afford tertiary education and about the effects of the drought on employment prospects; others mentioned the stress their parents were under and the effects of dry conditions on the availability of sporting facilities (YACVic 2008).

Given that drought has such major impacts, it is important to know how bad it is and how likely it is to continue. The average annual rainfall for the Mallee region between 1961–1990 was 331 millimetres that was traditionally spring and winter based (Victorian Government Department of Sustainability and Environment, 2008). Between 1998 and 2007, average rainfall was 13 percent below this, and also temperatures became hotter with average maximum temperatures increasing by 0.7 percent and the number of days over 30 degrees increasing by eight (Victorian Government Department of Sustainability and Environment, 2008). For the Wimmera, annual rainfall long-term is 403mm (Commonwealth Scientific and Industrial Research Organisation [CSIRO] 2007). As with the Mallee, rainfall was 13% below average in the ten years 1997–2006 (CSIRO 2007). Predictions are that rainfall for the Wimmera-Mallee will remain at a lower level, although not at the low of the past ten years (Birchip Cropping Group, 2008b) which might lead to a wheat yield decrease of up to 18% compared with the twenty years between 1980–1999 (Birchip Cropping Group, 2008b). Farming adaptations such as introducing or increasing use of fallow, and retaining stubble were reported by the Australian Department of Agriculture, Fisheries and Forestry as increasing wheat yield in the Wimmera-Mallee, while changing varieties and adapting different planting regimes were found to have few benefits (Birchip Cropping Group 2008b).

The Buloke Shire, covering much of the Wimmera-Mallee region, scores well on some measures of community well-being and less well on others. The 2007 Community Indicators Victoria survey (Community Indicators Victoria [CIV], 2008) shows the shire above average for Victoria on indicators of personal health and well-being, safety and absence of crime, housing affordability and community engagement; but below average on school-leaver outcomes, employment rates, educational qualifications and internet access. It is well below average in terms of average income, with a median equivalised gross weekly household income of \$396 compared with the Victorian average of \$600.

In the Wimmera-Mallee region there are several secondary schools, and while there is no TAFE college within the region there are several community centres which include adult learning activities among their range of offerings. It is generally accepted, although not uncontested, that learning can be described on points along a 'formal' to 'informal' (eg Marsick & Watkins 1990) spectrum. It might be expected that community members attending a formal course may expect to learn, whereas their learning from other activities in their community may be less conscious. Smith (2003) has extended the concept of formal vs informal learning for on-the-job learning at work to new categories of taught, sought and wrought learning. The latter applies to learning that is fashioned from experience rather than being intentional, and requires the ability to reflect on experience.

### **Research method**

Two visits were undertaken to the site. At the first visit, April 2009, five interviews were undertaken, with six at the second visit in July 2009. Some of these interviews had multiple participants. Four interviews were undertaken by telephone, with participants who were unavailable on the days of our visits. Six of the interviews were taped with permission—those on the second visit—while notes were taken

from the interviews on the first visit and the telephone interviews. Most interviews lasted around 30–40 minutes, with the longest being 75 minutes. The interviews were semi-structured and were based around the questions described in the introduction to this special edition. In addition we were provided with literature produced by some organisations and referred to relevant web sites; we also read local newspapers.

Details of the interviewees are given in Table 1, with an indication of the town at which or nearest which they were normally based; to preserve confidentiality the towns are not actually named. Some participants had a region-wide responsibility. The interviewees have been divided into three major categories, under which the findings will be reported. It should be noted that there is considerable overlap among the categories, with all respondents proffering information and views about issues pertaining to other categories. Many had more than one role with relation to water use; for example some people farmed as well as having community jobs.

*Table 1: Details of interviewees (n=28)*

<b>Role</b>	<b>Organisation</b>	<b>Town</b>
<i>Water supply/economic/domestic/social</i>		
Research manager	Water authority	Outside the region
Communication manager	Water authority	Outside the region
3 staff with responsibilities for economic & community development	Council	A
6 members	Gardening group	C
<i>Farmers/ farmer groups and support services</i>		
Farmer	Farming property	C
Executive officer	Farmers' development organisation	B

6 committee members/ farmers	Farmers' development organisation	B
Agronomist	Agricultural supplier	A
Agronomist	Agricultural supplier	C
<i>Community/education &amp; training organisations</i>		
Co-ordinator	Community/learning centre	A
Co-ordinator	Community/learning centre	B
Co-ordinator	Community/learning centre	C
Executive officer	Regional education and training organisation	D
Principal	School	B
Principal	School	C
Project officer	Regional community development organisation for women	C

The aim of the participant selection was to speak to those involved with all aspects of the water supply and use, and to those specifically involved with education and training services. Within the framework set for the research project as a whole, in which categories of stakeholders were identified, participants were selected by the 'snowball' method, which relies on pre-existing networks (Browne 2005); names of contacts who had participated in previous research projects were provided to the researchers, and these people suggested other people or groups to interview. It should be noted that a limitation of this method is that others outside these networks are not accessed. It should be noted that it proved quite difficult during the interviews and focus groups to encourage participants to confine their answers to issues to do with learning. Most were eager to tell the story of the effects of drier conditions on themselves and their communities, and how they had adapted to them. Due to the desire of participants to tell the broader story, the amount of data about methods of learning formed a relatively small part of the total data

collected. Data were analysed by visual inspection of the transcripts and notes for common themes which included both 'etic' issues (relating to the questions posed by the researchers) and 'emic' (arising from the participants' interests and responses (Stake 1995 20). It is recognised that the sampling methods may affect the validity of the conclusions drawn (Sadler, 2002, 132); however, the use of multiple perspectives in a range of different locations, as well as personal observations while in the locality for a total of three days on two different occasions, provided some confidence that the data were valid.

## **Findings**

### **Learning about water supply**

The water authority accessed water from reservoirs and bores and a small amount from the Murray. As a result of prediction work undertaken twenty years previously the authority was changing its delivery method to the Wimmera-Mallee from channels to pipelines. Pipelines would save 80 per cent of the water which was currently lost through evaporation and would also provide better quality water. Participants had varying impressions of the changes this would bring, depending presumably on where they had learned about the pipeline. A small number of participants believed the pipeline would solve all their water problems, while some were more circumspect, believing it would assist but that prices would increase. Spokespeople from the water authority mentioned several education strategies they utilised about water use: they provided leaflets with bills, produced booklets which were available in community centres and the like, displayed web pages about saving water and sponsored a weekly radio program about gardening. In addition they attended agricultural shows and field days, sent speakers to service and gardening clubs, and had constructed a promotional trailer. They also held community water-saving information sessions which were well-attended: 'usually more than expected' with between 50–150 attendees.

The water authority itself learned about climate conditions and water use by regular monitoring of inflows to and outflows from the system. From the former they had deduced that the water situation was worse than could be modelled under climate change and therefore that there was a drought (perhaps superimposed on climate change) which might improve in the future. They learned from outflow data that once the pipeline was introduced (which had already happened in the northern part of the region) people's improved water-use practices would not revert to pre-crisis conditions but were likely to retain their more conservative use of water. The authority had acted on feedback about community impact of water restrictions, and had reintroduced limited hosepipe use due to injuries to elderly people carrying buckets, and relaxed restrictions for sporting clubs. As the research manager said "It's a question of social responsibility".

Learning to be drier for economic, social and community purposes  
(excluding farming)

The representatives from the Council outlined the difficult economic situation in the area. They stated that 50 per cent of Victoria's grain had traditionally been produced from within 100km of where they were located and that drier conditions had badly affected this situation. They reported high levels of depression among farmers and one case of suicide in a business person. The Council was active in promulgating new ideas for farming crops, which used less water—for example the oil mallee tree. Council officers in turn learned about such possibilities from the Department of Primary Industries. They provided 'farm gate' visits so that individual farmers were aware both of available financial assistance and of different farming options; and spoke or brokered other agencies' speakers at local meetings, for example at fire sheds. It was felt that farm gate visits were useful in encouraging people to attend community meetings, and provided additional information for council officers to use in their planning. Several local jobs designed to address drought-created problems had been instituted, but were of a short-term nature due to limited

periods of funding from government (State and national) which made long-term planning difficult. Council officers indicated that there was awareness in the community with the range of initiatives and programs:

People are almost at the point of tiredness with the amount of activity that's going on. They are surveyed out. The challenge is to get practical activity happening.

Other participants also mentioned problems of decline in some of the towns. For example, an agronomist mentioned the difficulty of getting together a boys' football team:

Up at XXX (town) now in the football they've only got 12 kids in the under 16s and they get a car load of YYY (town outside the region) boys every week to help them play... Yes and they sort of ask the opposition side each week if they can have a couple of kids to help them. So it's getting pretty hard in terms of sporting and everything.

Several people mentioned the decline in volunteering. It was difficult to separate in people's minds the issue of dryness from rural decline; while there is clearly a relationship, some of the towns were growing, indicating other issues were also at play.

The gardeners' group included women who were active in many areas in the community. One participant mentioned the effects that the drought had on the golf and bowls club. Two participants were both former owners of the local nursery business. In relation to gardens all mentioned the imperative to adapt their gardens for drier conditions; heat was also an issue with one participant saying 'when we had those days that were 50 (in early 2009) a lot of the succulents just boiled within themselves'. One participant, however, had been able to maintain an 'English-style' garden despite restrictions until recently on anything other than hand-watering. In gardening, strategies such as better positioning or shielding from the wind were utilised as well as purchasing drought-hardy plants. Participants mentioned making

choices, for example shrubs or a vegetable patch, and focusing on keeping one area of the garden alive. During a visit to the farm of another participant, a visual confirmation of the effects on farm gardens was given with the participant indicating areas of cultivation that had been abandoned.

Water was carefully conserved, as the following interchange among members of the gardening group during the focus group illustrates:

- Interviewer:        So have you all put on extra tanks and things in the last few years?
- Participant A:        We put a really big one.
- Participant B:        Yeah we did.
- Participant C:        Everything that's got a shed.
- Participant D:        Yeah everything that's got a shed's got tanks.
- Participant C:        Everything that's got a roof's got a tank on.
- Participant B:        A roof, yeah.
- Participant E:        I've even got 44 gallon drums around the yard that catch a little bit of water off here and there.
- Participant C:        Anywhere there's a drip there's a bucket under there.

However participants in this group were tolerant towards those who cheated a little. One participant told a story about her elderly mother which related to the rule that waste water from the shower could be used for the garden.

My daughter called there one day and said, damn, Nanna's in the shower. She yelled out and Nanna wasn't in the shower at all but the shower was running... ..she's 90. Can't she put a bit of water on her garden?

The members of the gardening group reported that some strategies had adverse consequences; for example recycling water waste for garden use could render septic systems too dry, and if certain types

of detergents were used, could kill plants. These issues tended to be learned by trial and error and by adopting ideas learned from neighbours. More formal learning took place at the local nursery or from speakers at the gardening club. Speakers attended the club monthly and drought-friendly gardening was a frequent topic. The members also learned from gardening programs on television. Landcare also provided occasional seminars and ran courses for example on seed propagation. The garden club was well attended, often with 40 or 50 people. Participants mentioned that younger people were also well aware of the need to conserve water, which was passed on through the family.

### **Learning to be drier in farming**

In the region, two farmers' development groups operated: the Birchip Cropping Group and Farm Management 500. Both had membership fees which provided access to courses, information and cheaper entry to events. The Birchip Cropping Group provided some services to non-members including the results of its research into crop varieties and other farming matters.

As one participant who was an agronomist put it, the basic challenge facing farmers was that:

As a primary producer, you're trying to grow as many kilos of crop X for available millimetres of stored soil moisture.

After many years of drought, the moisture levels in the soil were extremely low. A wide range of improvements in farming practices were reported by participants including moving from keeping sheep to growing crops and within crops, to those that required less water; fallowing paddocks; sloping and sealing paddocks to catch storm water run-off; using GPS to sow seed and fertiliser in exactly the right location to utilise micro-soil conditions; dry-sowing to anticipate coming rain; retaining stubble; minimal or no tilling; and the use of press wheel technology to compact soil around seed to conserve

water. Some of these practices (eg those requiring better tractors) were very expensive (half a million dollars was quoted, for example) and it was stated that farmers often shared expensive equipment amongst themselves. The operation of electronic equipment and use of the internet were routine among farmers. Changing conditions meant that farms had grown through consolidation; around 3000–5000 acres was the norm now, whereas 200 acres used to be sustainable.

A group of committee members of one of the farmers' developments groups, all of whom were also farmers, provided the following information about the education strategies that they used with farmers about better farming practices, including working with drier conditions. There was recognition that people learned in different ways and therefore there was a need to offer a variety of strategies. It was felt that most people would not attend an event badged as a 'learning event' and therefore education activities needed to be blended with other activities—'good coffee and good speakers and a lot of fun and meeting your mates'. It needed to be something that 'gets people off the tractor'. Talks were often branded as 'relevant information to your decisions' rather than 'education'. One stated reason for these strategies was that some people had had previous negative experiences with learning. Attention also needed to be paid to rural etiquette. For example question and answer sessions might not always be felt appropriate as some farmers perceived questioning as being unduly aggressive—'rude and critical', and also may be afraid of being humiliated by asking an inappropriate question.

However some farmers were different and did enjoy learning as a specific activity; they might read or use the internet—'ferreting out' information. It was mentioned that increasing proportions of farmers were university-educated and therefore activities needed to suit all points on the educational spectrum. For example, a member of the farmers' development group said:

At the last expo, XXX who is a climatologist, oceanographer, sort of person gave a talk on climate models and the tent was packed with people. They were standing up the back and everything... and it was really quite a demanding lecture.

This group of people also discussed the range of attitudes towards changing farming practices: 'We have some farmers that have not moved and we have others who have moved tremendously'. It was felt that some farmers 'don't even see what goes on through the fence' and some were 'satellite learners who don't go out but they do see what goes on through the fence'. These were also described as 'tailenders'. It was also mentioned that some farmers adopted practices that others used but without understanding why; it was suggested that they were 'not doing the mental work'.

Another group of people who help farmers learn about farming practices are agronomists. These might be independent consultants who might be employed by an agricultural supplies group. The farmers' group mentioned above were fairly dismissive of agronomists, suggesting that they were generally trying to sell products and their advice might not be unbiased.

However the two agronomists that were interviewed appeared to have a genuine commitment to their clients and worried about the success of their clients' farms. They explained that their income could be derived from fee for service or from commission, or from a mixture. The work that agronomists did was summed up by one participant, a farmer, as:

...in the business of helping you look at your whole farm and decide what crops you're going to sow in each paddock and how much fertiliser you'll put on each crop and then which herbicide you're going to spray. They'll walk in the paddocks and find out what the weeds are and tell you what to spray them with and all that sort of thing.

The agronomists reported that farmers often had to make very difficult decisions, about whether they could afford fertiliser in a particular year, for example,

Not being able to farm, because of economics, the way they want to farm, in the way they should be farming. In relation to that, are things like not sowing a newer-type variety that they should be sowing (because) they probably can't afford to buy variety X for a large amount of money ... They haven't been able to apply the nutrition to the crop or pasture or whatever they're trying to produce to the value that they want to because economics haven't allowed it.

It seemed that many farmers used an agronomist and also received information from other sources such as farmers' development groups and the internet. Some participants in the farmers' development group had said that if members of the group approached farmers individually offering to help, it might cause discomfort. So perhaps the degree of control and privacy afforded by the act of hiring an agronomist, rather than receiving individual assistance from a representative of a community group was one thing that made learning from an agronomist more attractive to some farmers. Agronomists also reported that their work contained a great deal of counselling, although one noted that the degree of counselling was a matter of personal 'style' and that not all agronomists took this approach. It was clear that agronomists were extremely closely connected to their clients and to the farming situation in general; they were aware of the devastating effects that dry conditions were having. Although, as mentioned earlier there had been no farm suicides in the region, one agronomist reported instances in a town not far from the region:

I know up at XXX (town outside the region) there were five people who committed suicide within a space of only about two or three months... They'd taken their sheep to the YYY (stock agent), and they either didn't sell or they didn't sell for the price

they wanted, and they just, they just went home and ... ended their life. But that's just what drought can do to people.

As well as one-to-one work, agronomists provided presentations to local farmers and sometimes their branches mounted 'family fun days' and other events. One mentioned that he had taken farmers away to a two-day residential course to remove them from the pressure of facing their dry farms for that period of time. The agronomists reported that they did their own learning from a variety of sources: their initial agricultural degrees, their companies' training programs, mentors within the company, suppliers, learning from their customers, and visiting field days. One said that the field developed so quickly that more than a few months away from the work would send him a long way behind.

It was agreed however by a few participants that too much information was sometimes problematic; one council officer in particular said that people under stress did not want too many choices. It was also mentioned that people needed to be able to evaluate what they learned and assess the validity of the information in terms of the source. A member of the farmers' development group pointed out the need:

...to know the value of published peer review stuff compared to something that's put out by a snake oil person.

### **Changes to formal learning systems as a result of drier conditions**

Community Centres noted that course offerings had changed as a result of the drier conditions. Hobby courses were less common because all members of a family needed to work and did not have the same amount of free time as previously. Vocational courses which prepared people for work or for second jobs were more common: for example, heavy goods vehicle courses or fork-lift licences. A State government program called Rural Skills Connections worked with training providers to find work for members of farming families with

skills that could provide an income. In relation to farming matters specifically, the Federal government funded ‘Partners in grain’ workshops in several of the towns. These were heavily subsidised and included, for example, farm office management courses and spraying workshops lasting for a full day.

The water authority undertook a great deal of educational activity through schools. These included a quarterly newsletter with educational information for students—using the character ‘Phil the Bucket’ for primary aged children, an annual water poster competition for students, and an annual conference for students in Years 9 and 10 (approximately aged 15–16) on the theme ‘Is our water use sustainable for today and tomorrow?’ The latter conference involved a Skype link with New Zealand students in 2008. In another international link, the regional educational and training organisation had received funding for a program in which they sent 20 young people to California to visit farming communities, as a part of which they undertook pre-visits to Victorian farms. This exercise provided the young people with a good overview of farming practices and also showed them that Australian dryland farming practices were quite advanced although confidence was higher in the US despite practices not being as good.

Schools adopted water wise practices in their school grounds and taught them in the curriculum. A few participants mentioned that as this generation of children grew up, they would adopt different behaviour from the current generation of adults; it was mentioned twice, for example, that young children did not know what sprinklers were. School newsletters often contained information about water-saving, and these were distributed to the general community through local newsagents as well as to parents. It was hoped that community practices might be influenced through this means. As one principal said, the school was pivotal in the community in many different ways.

## **Discussion**

As the Wimmera-Mallee is a traditionally dry area, participants did not find it alien to be concerned about water and were open to learning better ways to work with drier conditions. Those who had lived in the region for longest, and particularly those who lived or had lived on farms, seemed to be particularly adept at utilising little water for domestic purposes.

Learning to be drier took place through a number of strategies that ranged in formality, including, arranged in increasing levels of formality—or from ‘wrought’, through ‘sought’ to ‘taught’ (Smith 2003):

- Feedback on actions eg planting a new variety of crop or garden plant.
- Individual learning through the receipt of provided information (eg from the water authority, from one’s children’s school, the local newspaper or magazines produced by agricultural suppliers) or from seeking information via the internet.
- Talking informally ‘over the fence’ (back gardens) or ‘through the fence’ (farms) to neighbours.
- Attending a community activity specifically on water issues or via another group eg gardening group or Country Fire Association meeting.
- If a farmer, joining a farmers’ development group and/or employing an agronomist, both of which sources were able to collect and filter information and pass it on.
- Enrolling in a course (from a short skill-focused program through to a qualification).

In addition it was clear that people learned from others’ experiences, particularly in those areas which had visible results such as crop planting or garden maintenance. This could be regarded as a form of social learning (Bandura 1977). This form of learning was evident

within formal as well as informal activities, for example in the trials of crops that were run by bodies such as farmers' development group, and hence does not fit neatly on the above spectrum.

The nature and range of people's engagement with the above activities varied according to individual circumstances and learning style preferences. Agencies seemed to be well aware of this and utilised a range of strategies to get their messages across. It was also clear, from comments from a number of participants, that some adults did not choose to engage in learning activities. This reluctance seemed to relate to a number of factors including previous negative experiences in formal education or the challenges posed to existing long-standing practices, which could be confronting (James 1999).

The interviews and focus groups revealed some interesting differences among participants and their views, which indicated some underlying tensions in the communities. These might be (albeit crudely) characterised as dichotomies as follows:

#### *Beliefs*

- Climate change believers vs drought believers
- Optimists vs pessimists

#### *Perceptions about others in the community*

- Farmers are slow learners *or* farmers are nimble adaptors
- People who did not change their practices were problems for the community *or* were making legitimate choices for their own land and lifestyle
- Businesses which sold agricultural products were exploiters *or* were partners with farmers
- People concerned with environmental issues were 'half-baked greenies' (in the words of one participant) *or* were responsible users and preservers of land

*Perceptions of the locus of responsibility*

- Believers in self-funded community initiatives vs believers in government-funded institutionalised programs

It was apparent that these tensions could affect learning processes—who got to learn, who engaged in learning and who didn't, who would feel comfortable with attending which events, and who was likely to act on what they learned. However as community relationships and perceptions were not the focus of the research, it was not possible to draw firm conclusions.

The actual process of the research also raised some not unrelated issues. It was clear that the major participants in issues of drier conditions and community adaptation to such conditions were well known to each other, albeit the degree of mutual respect varied. However as researchers we were conscious that there were many people within the communities that we did not access due to the sampling method (Browne 2005) and that the picture we have provided may be incomplete. These 'omitted' people may also be omitted in other research and perhaps in community initiatives as well. These people might be the 'hard to reach' group mentioned by the farmers' development group participants, or might be otherwise. It was also salutary, and perhaps indicative of the difficult times being experienced, to note that while most participants were extremely helpful, a few, while readily agreeing to participate, expressed some resistance to the research. These people's views may be summed up as feeling that the community was over-researched, that they wanted to see some practical strategies suggested as a result of the research, and that they were not confident that this outcome would emerge.

It should be pointed out that the foregoing statements are not intended to negate the strong evidence we gathered of community strength and cohesiveness. One agronomist, for example, said

The towns are small and struggling so there's no real competition as to trying to grow a better crop than your neighbour ... There might be a couple of blokes like that but not really ... There's been cases where some farmers have been injured through work and have been in hospital or stuck home in bed for a few weeks and at a busy time of the year when it's cropping, you know, the local community get three or four guys together and they'll go out and sow their farm for them and help with stuff like that.

As mentioned at the beginning of this paper, 2009 was proving a good rainfall year in the Wimmera-Mallee region, the best for six or eight years according to two participants, and participants mentioned the increased depths to which soil moisture was reaching. Both school principals reported having to educate the children about bringing mud into the school and one said the school had needed to undertake a program of re-roofing. One principal said

I had to ring up a grandparent last week and ask if they could come up and pick their grandson up, take him home and shower him and put these new clothes on him. So that's the most interesting thing that we've had to do this year. We've got so many kids getting wet and dirty and muddy.

However there seemed to be a refusal to be too optimistic. One participant said:

The worrying thing is, if we have a really good year, that some people might just clear their debt, pack up and leave as well.

Another participant said that there was no certainty until the crops were harvested; in the previous year, rainfall had been good at the beginning of the season and then tailed off. Our research suggested that, however the 2009 season concluded, the individual and community learning undertaken during the period of drier conditions would persist into the future.

## **Conclusion**

At the commencement of this research, we had hoped to clarify some of the modes of learning and particular strategies which people in the dryland area used to gain information about living with less water. The nature of the learning varied according to peoples' circumstances and personal preferences. From the data, its analysis and the discussion above, the following strategies were identified: feedback on actions (seeing the results of personal activities); individual learning through the receipt of provided information or from seeking information via the internet; talking informally with others; attending a community activity focussed on the provision of information about water issues; using a professional group or service and through formal learning (enrolling in a course)

We identified some underlying tensions relating to personal beliefs, perceptions about others in the community and about the locus of responsibility. While these tensions would probably affect learning, it was outside the scope of this research to delve any further into these variations.

Most participants were very obliging in providing us with information; however, we were also aware that some felt that their contributions would not necessarily lead to any change in their circumstances. We are also very conscious of the fact that there would be individuals or groups who were under-represented in our data, so we acknowledge that bias.

In consideration of the information gained, we raise the following questions: What is the best way forward? Are there new strategies that can be developed? It is possible that future research could focus on those groups of people who appear to be disengaged from the community activities which are currently used as vehicles for delivery of information. Only after research into this issue could ways be developed either of motivating such people to engage in existing activities or of considering activities that might be more suited to this target group.

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