

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

186,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Different Farming Methods – But No Solution to Improve Rural Sustainability and to Save Australia's Family Farm

Ingrid Muenstermann

Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/54673>

1. Introduction

The title of this book is *Environment and Sustainability*. Having had an interest in the sustainability of the Australian environment as well as in the Australian family farm, it did not take long to expand on some ideas that had been discussed in a journal article regarding cross boundary-farming (Muenstermann, 2009). Cross-boundary farming is embedded in the common property resources system. This is a literature review regarding four different farming methods in Australia, i.e. family farming, co-operative and corporate farming, with special emphasis on farming using the common property resources system. Some thought will be given to the opportunities these different methods can offer the small family farm. This chapter will also look at the results of a forum regarding cross-boundary farming, which was held in 2007, and at the attitudes of farming families in relation to their sustainability as a production unit, expressed at a meeting which was held in 2012. Both events took place in the regional city of Wagga Wagga, New South Wales, Australia. The city has a population of 63,000 and is surrounded by farms, many are for sale, which provides an indication that change is necessary.

Australia produces beef, cotton, dairy, dried fruit, grains, rice, sheep meat, sugar and wool (National Farmers Federation, 2012). According to the National Farmers Federation (2012), there are approximately 134,000 farm businesses in Australia, 99% are family owned. In 2010/11, there were 307,000 people employed in the farming industry. The National Farmers Federation found that “the complete agricultural supply chain, including the affiliated food and fibre industries, provide over 1.6 million jobs”. The gross value of Australian farm production in 2010/11 was A\$48.7 billion, which was 3% of Australia's GDP. These figures are increased to A\$155 billion or around 12% of GDP when processes that food and fibre go through once they leave the farm are added. The Australian Natural Resources Atlas (2002) finds that “in 1996 the median gross farm establishment (farm business) income was estimated

at A\$96,400 (using 1996 dollars and farms with at least \$5000 gross income)” (p. 1). Considering that farm maintenance, seeds and crops, feed for animals and household as well as living expenses have to be paid, farming income is low.

All of these figures demonstrate the importance of Australian agriculture and of the family farm, the contribution to the Australian economy and the high percentage of farm businesses that are family owned, i.e. 99% (National Farmers Federation). Unfortunately, as Alston pointed already out in 1991, the family farm is under increasing stress from fluctuating markets and severe droughts in many parts of Australia. Since 2000, Australia has been subjected to severe droughts and since 2010 Australia has also been subjected to severe floods. Farming and mining will suffer reduced production because of the floods, commodities like wheat, sugar, horticulture and coal are already increasing in price (ABC Rural, December 29, 2010). Between 1971 and 2006, the number of farming families has declined by 46% (Australian Bureau of Statistics, 2006), from 190,466 to 102,606. Farm production in 2002/03 had a downward impact on GDP of 1%, which indicates a decline in chain volume terms of 28.5% (Australian Bureau of Statistics, 2004). In comparison, the corporate farming sector (any agricultural business with an annual income greater than A\$2 million) is growing fast. Although overall corporate farms only presented 1.5% of all farms in 2006, the number increased by 55% between 2001 and 2006 (Clark, 2008). Corporate farming businesses increased further: by 2011 the number was 2,601; an increase of 791 or of 44% (Australian Bureau of Statistics, 29.6.2012, pp. 14-15). Corporate enterprises now make up 1.8% of all farms. According to Clark (correspondence 2012), “in 2006 corporate farming generated an estimated A\$7.7 billion (20%) of farm production. In 2011 corporate farming generated A\$18.9 billion (39%) of farm production”.

The findings are important because they relate to rural sustainability and to the future of the Australian family farm. A report by Cara Waters (June 26, 2012) considers “The end of the family farm? 72% of family farms don’t earn enough to support the family on them”. Farming has always been associated with life style, it was never considered a business only. Could a common property resources system save the Australian family farm from its fate? Looking at the outcome of this research it seems that the individualistic and independent Australian farmers do not want to be ‘saved’ by such a scheme. However, it is argued here that such a system has some merit.

Australia’s best known common property system, the *Tilbuster Commons*, failed after five years despite being economically and environmentally successful. Reasons for the failure could be related to interpersonal relationships. This chapter will look at Elinor Ostrom’s philosophy of the commons and at lessons learned from the *Tilbuster Commons*. The purpose of the chapter is to establish the significance and usefulness or otherwise of different farming methods to create sustainable rural societies and economies.

2. Australian farming systems

2.1. The family farm

The family farm means, according to Tanewski, Romano and Smyrnios (2000),

ownership, place of residence, the family's contribution to labour, the family's responsibility for management, and the family's rural ethos or ideology (p. 15).

Reeve (2001) provides a somewhat more detailed definition:

Business ownership is combined with managerial control in the hands of business, these principles are related by kinship or marriage, family members provide capital of the business, family members include business principals, do farm work, business ownership and managerial control are transferred between the generational passage of time. the family lives on the farm (p. 1).

The definitions are similar, both stating that the place of residence has to be the farm, and that the owners and managers do farm work. The same meaning of a family farm was stressed in a study by Muenstermann (2010, 2011). Is it possible for Australian farming families to continue to exist in the present economic and environmental climate? Alston (1991, 2004) and Alston and Kent (2004) find that the small scale family farm has experienced growing pressure from fluctuating markets and severe droughts for ten years. The Australian Bureau of Agricultural and Resource Economics and Sciences (cited in www.fatcow.com.au) claimed that the 2010/11 floods have reduced the agricultural production by at least A\$500 to A\$600 million. Alston (1991) also referred to the subsidy war between the European Economic Community and the United States that have had profound effects on Australian agricultural production. She argued that operating in a global economy with major competitors who are heavily subsidised has left Australian farming families facing an increasingly uncertain future. According to Alston (1995a, p. 1), the number of farms has decreased by 39% between 1953 and 1995 (from 204,350 to 125,615). The Australian Bureau of Statistics (ABS) (2006) showed a decline of 46% between 1971 and 2006 (from 190,466 to 102,616). But, according to an Australian Bureau of Statistics Release (29.6.2012), in 2010/11, 121,000 businesses reported agriculture as their main activity which represented an increase of 1% compared with 2009/10. It is assumed that the latest figure includes family farms as well as corporate and co-operative farms operated by families.

Farming as a lifestyle identity is declining and market based farming is growing (Barr, Karnuarama & Wilkinson, 2005). The net farm income has decreased, especially for the smaller farmer, and many women seek off-farm income in order to sustain the farm (Alston, 1995a, 1995b; Alston & Kent, 2004; Muenstermann, 2010, 2011). Raven (1995, September 14) suggested that thirty years ago, costs took 50 to 60% of the gross income, they now take 80 to 85%. Adding to the problem farming families face is a younger generation that feels reluctant to enter the farming industry. The number of young men entering agriculture has declined by 40% over the last twenty-five years; the number of young women in their early twentieth entering the

farming industry has declined by 80% since 1976 (Barr et al., 2005). The future of the family farm, as Australia knows it, seems unpromising unless restructuring will take place.

Restructuring is contemplated by Share, Campbell and Lawrence (1991) who looked at this issue, considering vertical restructuring of agricultural commodity chains, and horizontal or spatial restructuring of the labour markets and industries. Vertical integration is a process through which family farming could be integrated into areas of industrial capital. "It is most likely to be initiated in situations where available marketing or supply channels are being closed to the farmer or where pricing mechanisms are deteriorating" (Williamson, 1987, p. 4). Farm-based food and fibre production shifts from 'formal' to 'real' subsumption of capital: industrial capital takes over part of the production process (i.e. fertilizer, pesticide, herbicides, marketing of farm commodities), but the farmer is reduced from a relatively autonomous producer to a labourer (Davis cited in Share et al., 2005, p. 2). Vertical restructuring by industrial or transnational capital affects the integration of family farms into capitalist production and will change the nature of farm work, the marketing and distribution of agricultural products. It will change the autonomy and control of farmers.

Horizontal restructuring relates to changes in the spatial distribution of industry sectors and labour markets. Lash and Urry (cited in Share et al., 2005) found that within so called disorganised capitalism global capital has become "increasingly spatially footloose, while the global labour force is tied to specific localities" (p. 2). This means that global capital takes advantage of optimum production conditions. As a consequence, in a rural area farming may just be one area of development and a region may have several combinations of capital, for instance different industries may co-exist. Share et al. (2005) also discussed traditional primary industry incorporating newer tourist development. There could be relocation of manufacturing or service industries into the area. It is very possible that a region unable to attract mobile capital will decline. Help from the government is not forthcoming: Australia has, in response to global restructuring, removed protection barriers and exposed its economies to international market forces. Keynesian policies have been dismantled, meaning that government support for agriculture is now severely cut because of the introduction of user-pays principles and the withdrawal of subsidies, concessions and price underwriting.

Apart from the issues discussed, there are also personal perspectives of farming families. Gray (1991) explored the values of these families and looked at motivations which guide farm decision making, i.e. foster an understanding of farm responses to economic conditions. He concluded that the ideal of generational succession has persisted mainly among couples to whom the rural aspects of farming are very important. In other families, attitudes which constitute the ideological foundations of the family farming have weakened:

While the ideals traditionally associated with family farming appear increasingly unrealistic as the viability of small farms diminishes, the traditionally valued features of farm life also appear less important as economic concerns become overwhelming and the farm system moves toward fundamental change (Gray, 1991, p. 67).

Muenstermann (2010, 2011) could establish that young women were encouraged by their mothers to leave the farming tradition, get an education and seek employment opportunities elsewhere.

Overall the literature regarding the future of the Australian family farm paints a fairly negative picture. Therefore, explored in the following are, at first, co-operative and corporate farming methods, followed by an outline of the commons, how it found its way back into modern society and the Australian experience of it.

2.2. Co-operative farming

A co-operative is defined as an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. (Wickremarachchi, 2003). A co-operative may also be defined as a business owned and controlled equally by those people who use its services or who work at it. Co-operation is intrinsic to human organisation, and the history of modern co-operative forms dates back to the agricultural and industrial revolutions of the 18th and 19th century. In today's Australia, co-operatives exist in most industries, including agriculture, and they are regulated by State and Territory Government legislation (Wickremarachchi, 2003). An agricultural co-operative incorporates primary producers who try to achieve common commercial objectives more successfully than they could individually. All objectives relate to continuation and improved profitability of members' farm enterprises (Australian Co-operative Links, n.d). The most common forms of agricultural co-operatives in Australia relate to marketing, input supply, and agricultural services. Marketing co-operatives embark on transformation, packaging, dispersal, and promotion of farm products. Supply co-operatives accrue purchases, and store and distribute farm inputs. Agricultural services co-operatives include banks, dairy, food processing, and educational services. In the Riverina area, around Wagga Wagga, the Rural Australian Education Centre Co-operative Ltd., Henti Machinery Field Days Co-operative Ltd., Orange Field Days Co-op. Ltd., and Primary Management and Training Concepts Co-operative Ltd. can be found (Co-operative Development Services, 2012). In recent times the co-operative systems have been criticised. According to a report by David Griffiths (2008), farmers have always looked to the co-operative model to provide them with some protection in the free market, but business advisors are now claiming that co-operatives are unsustainable. Griffiths warned:

Co-operatives are member-owned, member-controlled businesses designed in the case of dairy farmers to maximise the return they receive for supplying their milk. Other business forms, such as publicly listed companies, exist for the sole reason of maximizing the value their share holders receive by way of dividends and increasing share price ... the two cannot live together harmoniously for very long. Either you maximise the milk price at the expense of profit and returns to shareholders or you minimise the milk price in order to increase profit and returns to shareholders. There is no middle way (Griffiths, 2008).

Griffiths concluded that the indifference of farmers and their advisors toward the co-operative model could lead to a situation where farmers will have no access to the profits derived from value-adding to the produce they supply.

There can be no doubt that farmers and their co-ops operate in a highly unstable environment (Williamson, 1987). Bijman (2002) raised concerns about co-operative farming and found that many changes in the organisation of agrifood transactions have taken place, that consumers demand high quality products, more variety, and more convenience. Consumers have become concerned about food safety, production conditions, environmental protection, and animal welfare. These changes challenge farmer-owned co-operatives. How do co-operatives deal with the combined innovation in product and marketing? Where does innovation take place: at the level of the member company or at the level of the co-operative? Does the co-operative have the capability to carry out new activities? If so, do members have sufficient knowledge to control the managers executing these new tasks? Can members raise sufficient capital to make the necessary investments in innovation and marketing? Can co-operatives build sufficient market power vis-à-vis large food processing companies and retailers?

Chaddad and Cook (2002) also raised concern regarding co-operatives. These organisations may be referred to as member-owned, however, when they depend on outsiders for financial support that ownership is lost because the financial contribution of the co-operative membership is small compared to the non-member contribution. Despite of the one-member, one-vote principle, non-members who are the major suppliers of capital usually determine the main priorities of the co-operative business. Oczkowski (2004) analysed agricultural bargaining co-operatives that negotiate, on behalf of member farmers, with food processors over price and quantity for raw agricultural output. He found that

... the level of prices ... depends upon the co-operative's relative bargaining strength. ... Given the typical financial, physical and human resources of investor-owned firms such as large food processors and the relatively small resources of farmer bargaining co-operatives, it is expected that members would be more impatient (less able to hold-out) in negotiations. Further there is a general expectation that farmers exhibit a relatively greater degree of risk aversion compared to the entrepreneurial focused investor-owned corporate processor. The consequence of a low co-operative's bargaining strength are relatively low levels for co-operative objective values, and market and member prices (Oczkowski, 2004, p.16).

In 2006, Oczkowski looked at structural changes necessary for co-operatives to survive: the effects of globalisation on agriculture cannot be ignored. He argued that the restructuring of the agricultural sector needs substantial amounts of additional capital which will lead to new co-operative forms. These forms would maintain some of the old traditions and present viable alternatives to full demutualisation and conversion to the investor owned form. Von Pischke and Rouse (2004) provided strategies for mobilising capital in agricultural co-operatives: restructure members' incentives in ways that work constructively (in a commercial sense), and harmonise members' roles as users of the co-operative with their role as investors providing the capital.

The question here is can co-operative farming save the Australian family farm? How much capital can the cash-stricken, small scale farmer invest in these institutions in order to benefit in such a way that the family farm can be saved?

2.3. Corporate farming

Corporate farming is another way of looking at the Australian farming industry. It must be mentioned that being part of corporate farming requires more capital than participating in co-operative farming and, looking at our definition of the family farm (i.e. ownership, place of residence, family's contribution to labour, family's responsibility for management, and the family's rural ethos or ideology), the concept may not quite fit. Since corporate farming in Australia is on the increase, it was decided to offer some thoughts on the system.

Corporate farming relates to the modern food industry. It encompasses the farm itself and usually a chain of agriculture-related businesses, including seed supply, agrichemicals, food processing, machinery, storage, transport, distribution, marketing, advertising, and retail sales. According to Tont, Halpin, Collins and Black (2003), corporate farms usually have a diverse group of shareholders/owners, the day-to-day management occurs at the property, but decisions are usually made at the corporation's headquarters. The scale of the properties, in terms of land occupied or in terms of production, tends to be high and there is very often a mixture of foreign and Australian ownership.

Clark (2008) published data on corporate farming in Australia. It generated 24% of agricultural production (combined revenue A\$9.4 billion), there are 1,806 corporate enterprises with revenue of more than A\$2 million. The number of corporate farms has increased by 55% between 2001 and 2006; but they represent only 1.5% of all farms. According to Clark (2008), family corporate farms represent 58% of these businesses. Family corporate farms are mainly found in the grain, pastoral and dairy industries; they are robust businesses with good succession planning and can withstand production variability. The 42% of corporate-corporates, which are larger than the family-corporates, are dominant entities in horticulture, cotton, pigs and poultry. Corporations are generally found in areas where there is ample irrigation water.

Considering the Australian small family farm with an annual income of between A\$5,000 and A\$94,000 (Australian Natural Resources, 2002), it is difficult to imagine how these families can enter the corporate sector as independent entity. Briton (2005) contemplated that "slowly but surely, the farm is being wrenched off the family farmer and integrated more closely into the corporate modus operandi of agri-business" (p. 28). And he quoted Phil Ruthven as saying "it is far better to swap fierce independence for mutual reliance and higher profitability – 40,000 viable farmers are preferable to 112,000 marginal ones" (p. 28). Compared to these attitudes, it is interesting to note that some states in the US have instigated constitutional provisions to counter corporate ownership (Institute for Local Self-Reliance, 2009): nine states place some restriction on corporate-owned farms, and two states have anti-corporate farming restrictions written into their constitutions. Supporters of the anti-corporate farming laws have argued that, in general, agriculture-dependent counties in states with anti-corporate farming laws fare

better: they have less family poverty, lower unemployment and higher percentages of farms realising cash gains compared to agriculture dependent counties in states without such laws.

Anti-corporate farming laws do not exist in Australia and there are, as far as could be ascertained, no comparative Australian studies so far regarding the overall well-being of small farming families in an environment of corporate farming. However, it is assumed that small family farms are disadvantaged when corporate enterprises operate in the same location and within the same line of business.

In the following section, an old system is being reinvented, the commons.

3. The commons

Considering rural sustainability, the commons could play an important part because, if managed, natural resources are used without destroying the ecological balance of an area. In general terms, a common is a piece of land owned by one person or organisation over which other people can exercise certain traditional rights. Commons have a very long history in Europe, the most famous examples are the forest commons in Britain which are still in operation after thousands of years (ABC, 2001). Short (2008, p. 195) found that over a period of 500 years common land evolved as being distinct from other types of land because, while the ownership of the land remained private, the same land was subject to rights of common. These rights were held by other individuals that entitled them to specified products from that land.

Any commons system demands rules. According to Short (2008, p. 195) over the whole of Europe, previously rules were developed independently and, as a consequence, they were complex and the rights varied from one common to another. Today, there are almost 8,700 registered units of common land in England and Wales, representing 3% of the land area in England and 8% in Wales. Legislation is necessary, the last Commons Act was passed in 2006, “to promote sustainable management into the 21st century” (Short, 2008, p. 195).

3.1. The contemporary common

Elinor Ostrom wrote a thought-provoking book, *Governing the Commons* (1990a). She researched the system of the commons and was convinced that it offers an alternative to the traditional (mis)use of land and natural resources. She also provided the following advice to those who want to enter into a contemporary common:

Any group that attempts to manage a common resource (e.g. aquifers, judicial systems, pastures) for optimal sustainable production must solve a set of problems in order to create institutions for collective actions; there is some evidence that following a small set of design principles in creating these institutions can overcome these problems (Ostrom, 1990b, n.p.).

Here are Ostrom's (1990a,) principles which have been the basis of long-enduring common property resources (CPR) institutions:

1. Clearly defined boundaries.
2. Congruence between appropriation and provision rules and local conditions.
3. Collective-choice arrangements.
4. Monitoring.
5. Graduated sanctions.
6. Conflict-resolution mechanisms.
7. Minimal recognition of rights to organise.

For CPRs that are parts of contemporary systems:

8. Nested enterprises. Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organised in multiple layers of nested enterprises (p. 90).

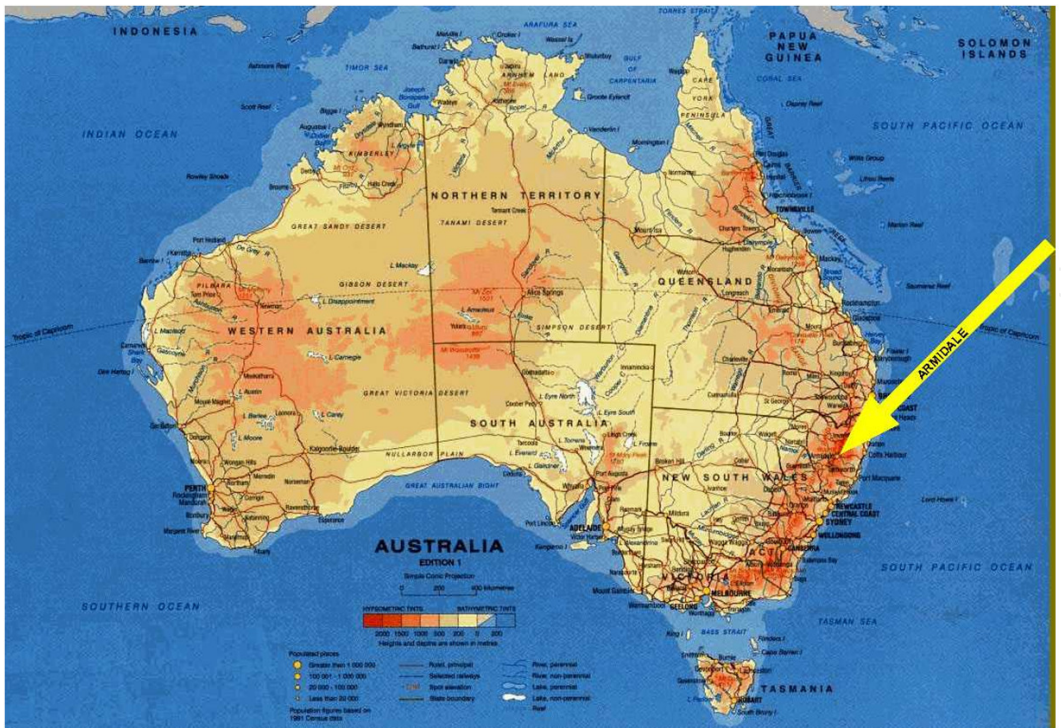
These principles seem, at first glance, complex and difficult to implement, however, every institution has its guidelines which need to be followed in order for it to function. If people are serious about rural sustainability and about maintaining farming families, the price to pay may be adherence to these rules. They would need to be negotiated according to different groups and different needs.

Ostrom discussed advantages and problems associated with the system. There was, for instance, *The Tragedy of the Commons*, an influential article written by Garrett Hardin in 1968 (pp. 1-28). Hardin's argument was that the environment will be destroyed "whenever many individuals use a scarce resource in common" (Ostrom, 1990a, p. 2). The purpose of his article was to demonstrate that tragic consequences can follow mistaken morality. This morality relates to expectations of equal justice and universal human rights of participants of commons. To stop such losses external intervention or control is needed. Hardin (1968) argued that "freedom in a common brings ruin to all" (p. 1244). In 1991 he redefined his argument somewhat but reiterates that his "conventional wisdom"... "holds true for unmanaged commons". In 1998 he, again, emphasised that "overuse of resources reduces carrying capacity, ruin is inevitable" (p. 3). Ostrom agreed with Hardin's 1968 criticism to a certain extent but believed that certain principles (rules and regulations) could prevent a tragedy.

Since the writer of this chapter is of the opinion that common property resources systems could have positive consequences for rural sustainability (including the family farm), here is a summary of the Australian experience.

3.2. The Tilbuster Commons

The experimental Tilbuster Commons project existed between 1999 and 2004. A group of four landholders and their families selected the land "on the basis of their shared values, concerns and future aspirations" (Williamson et al., 2003, p. 23).



Source: <http://www.southdevon-cattle.com.au/armidale.htm>

Figure 1. Tilbuster Commons was established close to Armidale, New South Wales, Australia.



Source: <http://www.records.nsw.gov.au/state-archives/resources-for/people-in-regional-nsw/regional-repositories/armidale-regional-archives-repository>

Figure 2. A close look at the area where the Tilbuster Commons were established in 1999.

The four families with adjoining landholdings in the Tilbuster Valley, 20 km north of Armidale in New South Wales, Australia, established a *common property resource system*, embracing some 1300 hectares. Funded with a A\$208,000 grant from Land & Water Australia, and facilitated by staff from the Institute of Rural Futures at the University of New England, the group’s objective was to produce a legal framework for a self-help resource management institution that was not only viable in their own circumstances but which could be transferred to other groups of landholders in different locations (Brunckhorst, 2003). The key assumptions underpinning this framework can be related to what Tosh (2006) classified as a *prescriptive* historical analogy. It draws on the past to recover best practices that can be adopted in the present: in this case lessons learned from the commons of England.

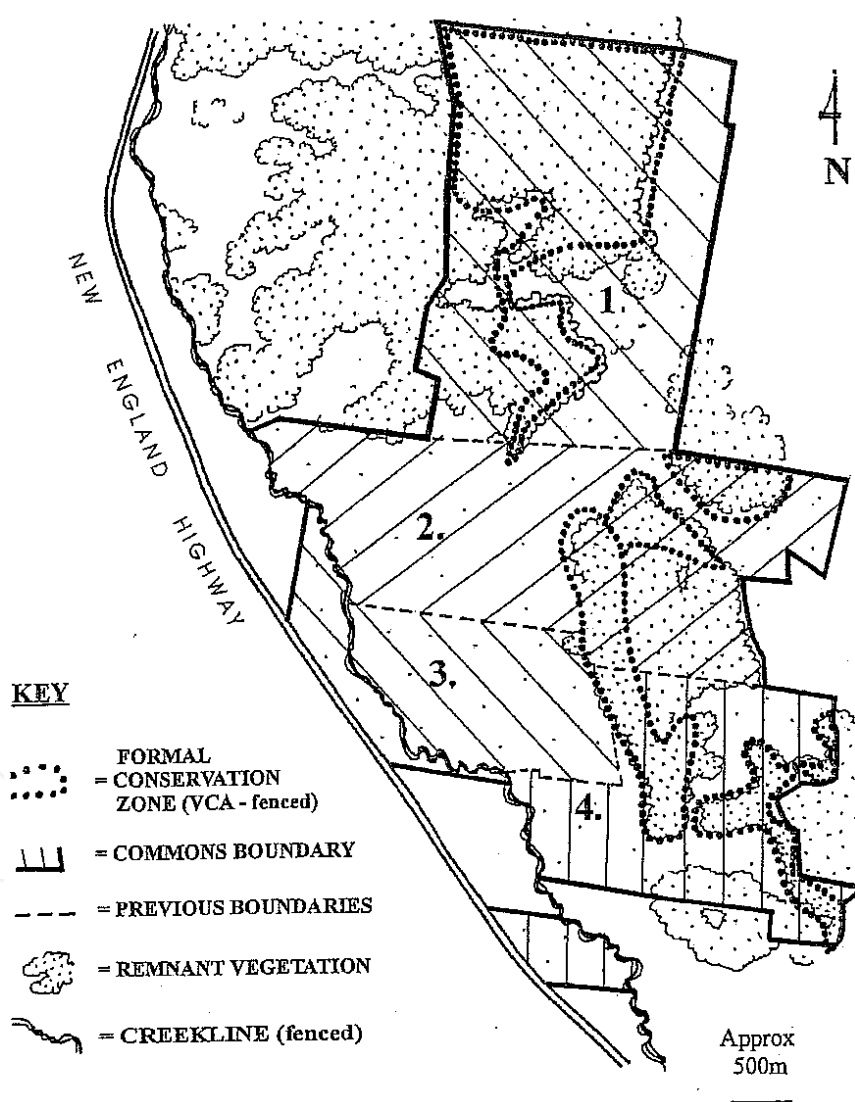


Figure 3. According to Brunckhorst and Coop (2003, p. 16), the Tilbuster Commons involves the collective management of four previously individual properties. The changes management is providing opportunities for increased efficiencies in agricultural production, more sustainable agricultural management practices, long term conservation and maintenance of rate basalt associated ecosystems and the restoration of woodland and stream environment.

Williamson et al. (2003) reported that two years of preliminary discussion provided an important vehicle for the group to begin building the necessary social capital which is required for the transformation towards whole system planning, resource allocation and collective decision-making. The independent owners and managers of properties realised their plans for an improved lifestyle and a more sustainable environment could easily fail if a common ground was not established. This common ground is embedded in social capital, relating to the cohesiveness of people in a community; it comprises trust, reciprocity and exchanges between individuals to make co-operation possible. It took a further eighteen months of planning legal structures and corporate arrangements. The group created a private company which provided for informal tenancy at will with the landholders being lessors and the company being the lessee. This arrangement allowed to start rotational grazing across all properties. The informal tenancy became a fixed term lease, providing stability and protection for both individuals, retaining land title, and the company, using and managing the whole resource base represented by all properties. Issues considered were livestock, grazing and pasture management and allocation of conservation and environmental rehabilitation areas. There were also issues associated with the operation of the commons (management, book-keeping, accounting), allocation of land to the common (private use of small areas, particularly around each member's home), key infrastructure, development of a formula which represented the interests of each member in the common, and allocation of land and resources to the maintenance of ecosystem function. According to Williamson et al. (2003), the group gave the commons a new lease of life: cross-boundary farming is important for sustainable Australian agriculture. In 2001, *The Tilbuster Commons Pty Ltd* was registered and the group started to function as a business in the next financial year.

Williamson et al. (2003) discussed that the arrangement of a common property resource system, the collective decision-making, and trying to achieve the holistic goals of the group created some conflict of interest because the landholders were also directors of the company: with both hats on, individuals are considering the best options to benefit themselves and other members through the company. Hardin's *conventional wisdom* (1991), relating to *managed commons*, and Ostrom's principles *regarding governing commons* (1990a, p. 90) may have been an underlying force in establishing the rules of the *Tilbuster Commons* and maintaining its functioning for a while. Ostrom's guidelines reiterate Hardin's *conventional wisdom* and make clear that regulations are important for the management of commons or, as in this case, regarding cross-boundary farming. Table 1 demonstrates how the *Tilbuster Commons* functioned.

What are the advantages of such a system? Table 1 (Williamson et al., 2003, p. 68) defines the differences between conventional property management and cross-boundary farming management. Under conventional property legislation primary producers are required to fully utilise the resources available within their own property in order to survive economically. Faced with various family and economic pressures and only a few resources at the landholders' disposal, there is often no option but to overuse the resources. Input costs tend to increase to help production and counter negative trends of water quality, parasite load; and production from the farmed and grazed areas is reduced. On the other hand, Williamson et al. (2003) found that the *Tilbuster Commons* could allocate the available resources more efficiently and effec-

tively. The individual and collective benefits of the project included grazing over a much wider area, reduction of input costs, increase of production, improved pasture and weed management (no fertilisers used), water and drought management, as well as more effective pest control. Cropping for winter feed or purchase of feed was not necessary, neither was the provision of natural minerals for stock. The most important benefits included long term conservation and maintenance of ecosystems, restoration of woodlands and stream environment, as well as the freeing up of time and labour. As a consequence of this, the families were able to get away for a holiday leaving the gate open when the livestock was on another property. Overall, by recognising the distinction between resource allocation and utilisation (the geographical elements) and land tenure (a part of the institutional elements), these landholders were able to consolidate their stock and graze them across all properties involved in the agreement.

Institution (social not legal)	Ownership	Owner’s Rights	Owner’s approach to management
Private property	Individual	Individual control; Exclusive control of access and alienation	Avoid socially unacceptable uses; Subject to some external regulation; Externalisation of pollution and degradation
Common property resources system, (cross boundary farming)	Collective	Exclusion of non-owners; Collective regulation; Internal pressure to comply	Maintenance; Constrain rates of use; Internal monitoring; Internalise negative externalities
State property	Public via government	Determine rules usually through government agencies	Maintain social and political objectives
Open access	None (no property rights or exclusion)	Capture	None

Table 1. Four major property institutions in Australia and their ownership, rights and duties (Source: *Williamson, Brunckhorst & Kelly, Reinventing the Common, 2003, p. 68*).

The positive issues discussed above have to be offset by some adverse aspects of the system. Williamson et al. (2003) pointed out that the change of ownership means a change in directorship and this can create problems. When a property is sold, it affects the system by fragmenting the landholding and the directorship of the company. There is also the issue regarding succession planning: who will inherit the property? Will it go to the child(ren) of the owner

who has passed away or will the property go to those who manage the farm? The terms in the lease need to clearly address these issues.

Brunckhorst (2003), following Ostrom, argued that:

The likelihood of users designing successful common property institutions will be enhanced if the group (or collective) is relatively small and stable; if it is relatively homogeneous, with the members using similar technologies and having similar values and expectations; if there is reciprocity and trust; and if the transaction costs for making and enforcing rules is low (p. 73).

This suggests that common property arrangements are well suited in scale to landholders struggling to maintain family farming operations. Yet a search of the literature reveals that attempts to duplicate implementation of the *Tilbuster Commons* model have, so far, not been successful.

3.3. Complexities of the commons – as seen by Australian farmers

According to the ABC's Landline program (2001), it was hoped that communal, cross-boundary farming, or the common property resources system, could be taken up in Australia to improve ecological sustainability. The *Tilbuster Commons* and the ideas that lay behind it attracted significant interest from practitioners of other disciplines and the media (Muenstermann, 2009; Meinzen-Dick, 2008; Marshall, Fritsch & Dulhunty, 2005; Marshall, 2004; ABC TV Landline 2001). In this process, some critics (Hajkowicz, 2006) contend that common property took on the character of a universal panacea for a rural 'crisis' that was indiscriminately held to apply across Australia. Looking at the decrease of farming families, a crisis exist, however personal communication with academics who are also landholders and farmers, conveys it is over-emphasised. Muenstermann (2009) suggested that a common property resources system has the potential to confer greater benefits on small farmers struggling to be more viable than alternative arrangements such as co-operative or corporate farming. Co-operative arrangements usually do not extend beyond joint purchases of plant and machinery or perhaps the pooling of labour at specified times of the year. Anecdotal evidence suggests that neighbours running sheep as a single flock is not unknown but less common, while joint action to address ecological issues is largely neglected. The Australian Natural Resource Management (2002) reasoned that "Australian farmers generally have a positive but pragmatic attitude towards environmental issues", hence "low farm incomes and high debt are likely to discourage adoption of sustainable practice" (p. 1).

Despite this finding, some farmers were trying to work collectively in order to address shared environmental concerns and to maximise financial gains, as the *Furracabad Valley Project* in northern New South Wales showed (Marshall et al., 2005). The project leader was a

member of the Institute of Rural Futures who drew on the *Tilbuster* experience to assist the *Furracabad* farmers in consolidating their environmental gains. But whereas preliminary budgeting suggested that the project had the potential to deliver economic benefits, the project team was unsuccessful during the nine months of project organisation to secure a commitment to a common property regime by a sufficient number of participants. According to Brunckhorst and Marshall (2006), the government supported project started with eighteen parties being interviewed, and five indicating “a serious interest in leasing their land to the proposed group farming arrangement within the near future” (p. 204). The follow-up workshop was only attended by four of the five members of the farm businesses. The individuals emphasised

“... the social and environmental advantages of joining the group farming arrangement, [but] they agreed that their decisions to join would depend ultimately on evidence that they would benefit in economic terms” (Brunckhorst & Marshall, 2006, p. 240).”

The participants were interested to advance towards the business plan for the group farming enterprise. However, at the next meeting one of these businesses had lost interest in joining, which, in turn, raised concerns that the deal may become unbalanced, given that one of the remaining businesses would be contributing three-quarters of the area. It was decided that a group farming enterprise was not viable with this decreased level of committed interest. The project did not progress.

A cross-disciplinary study by Pannell, Marshall, Barr, Curtis, Vanclay and Williamson (2006) regarding the adoption of conservation practices by rural landholders tried to understand why adoption of rural innovations seems to only occur when landholders perceive them as enhancing their personal goals. It is a provocative study, concluding that the “relative advantage” is the major concern. “Relative advantage” relates to the superiority of what is being superseded and to “the capacity to deliver sufficient economic and benefits” (p. 1407). The whole process of adopting innovative practices is “influenced by the characteristics of individual landholders, their families and broader social environments and by the characteristics of the innovation” (p. 1409), and “there is no guarantee that a landholder’s subjective beliefs will ultimately lead them to a final decision that is actually the one most likely to best achieve their goals” (p. 1409).

This is an important finding: subjectivity can easily override objectivity when farmers and/or landholders consider innovations. Pannell et al. (2006) determined that because of the way decisions were being made (“heterogeneity of circumstances”), they were only able to discuss “trends and tendencies, rather than deterministic relationships” (p. 1410). But the authors made the point that “economic factors” drive adoption of innovation (p. 1411). It

seems that personal gains are more important than community and / or environmental interests.

But an article by Marshall (2004) showed a different picture. He discussed his experiences in working with a jointly owned irrigation company in the Murray Darling Basin, an existing common property regime, which led him to conclude that preparedness to co-operate in implementing agreed plans is “more sensitive to socially oriented factors like perceptions of community benefits ... than it is to the private materialistic considerations - like distributive fairness and business security” (p. 271).

May be the difference in outcome can be related to the difference of ownership, for instance private property versus common resource? Overall it is argued here that contemplation of, and investigation into the legal complexities of a successful common property resources system and the rules that are needed to guard against free-riders, sit uneasily with the individualism that remains strong in many Australian farmers.

4. Thoughts on two meetings regarding the Australian family farm

Concerned about the issue of land degradation and the decline of farming families, a forum entitled *Cross boundary farming* was held in September 2007¹. The forum was advertised widely in the area (local press, Charles Sturt University Internet, a community radio station, contacting interested parties by mail). Just over thirty people of different professional status and from different regions attended. The organisers invited Professor David Brunckhorst (academic, landholder and participant in a common property) to be the main speaker. Representatives of the National Farmers Federation², of the National Party and of the Greens³, a property lawyer⁴, two members of the local farming community⁵, and two Charles Sturt University academics⁶ were invited to present their views or that of their organisations. The local member of the Labor Party was invited but could not attend. Apart from the speakers, forum participants included members of the Wagga Wagga City Council, a representative of Murrumbidgee Catchment Management Authority⁷, a member of the Riverina Country Women's Association, a hobby farmer, an organic farmer turned restaurant owner, a previous dairy farmer, a member of the Department of Primary Industries, Ballarat, Victoria⁸, and

1 Financially supported by the Institute for Land, Water and Society and the School of Humanities and Social Sciences, Charles Sturt University.

2 Mr Bill Baker, Brucesdale, NSW

3 Ms Rachel Siewert, Green Senator, Western Australia; Ms Melanie Pavey, National Party, Member of Legislative Council.

4 Mr Bill Thompson, Cummins Hendrick, Coolamon, NSW

5 Mr Tony Dunn; Mr Paul Nolte, Wagga Wagga

6 A/Prof Deidre Lemerle, A/Prof Ian Gray

7 This authority was established in 2004 to make sure that local people have a say in local resources management.

Charles Sturt University students and academics. Overall the forum represented a good cross section of the local community. The participation of two national politicians gave the forum and its underlying objective special importance.

The objective of the forum was to stimulate discussion whether cross boundary farming or the common property system could benefit contemporary Australian farming families. Brunckhorst provided an overview of his involvement with the *Tilbuster Commons*. He discussed the economic and ecological advantages, and the environmental and economic improvements the project had achieved during its five year existence. He also made clear that a common property resources system needs strict rules and that, despite legally binding regulations, problems can occur and unexpected difficulties can arise. Brunckhorst also mentioned the problem of free-riders and the importance of social capital, trust and reciprocity, which are important elements of a common property resources system.

The president of the National Farmers' Federation pointed to the sharing of large equipment amongst farmers and to the benefit of co-operatives. He did not believe that the common property resources system would be viable in Australia, pointing to the psychologically ingrained individuality and independence of the farmer and of the farming community as a whole.

The member of the Green Party raised serious concerns regarding the sustainability of the environment, advocated that cross-boundary farming offers economic and ecological advantages, but she could understand if farmers opted for an approach that was easier to put into practice than the common property resources system. The importance of the family farm in relation to Australia's economic well-being was emphasised.

The latter point was agreed to by the representative of the National Party: farming families are a very important part of Australia. Regarding the common property resources system, a pessimistic view was presented; it was thought that farmers under present climatic circumstances were acting appropriately but that the government fails farming families and should provide financial assistance to those in difficulties. Financial help is important because overseas farmers [USA and Europe] are highly subsidised.

The Charles Sturt University academics pointed to the psychological stress that would occur if farmers and their families were to form closer relationships with other people. They may share the same aspirations and hopes, they could be strangers or long-time friends and neighbours; but it would be difficult to initiate strict rules and regulations. Would trust and reciprocity endure or would participants eagerly observe each other in anticipation of free-riding? The academics also pointed to the fact of climate change and that many years of drought have had a negative effect on the Australian environment and on farming. It was suggested that the farming community took a more long-term, sustainable approach.

⁸ Had travelled considerable distance to participate in the forum.

The property lawyer presented concerns regarding succession planning if the common property resources system was implemented. He made the point that this issue would be the greatest impediment to overcome. There was no suggestion on how to solve the problem: if cross-boundary farming was taken up, each case needed to be assessed at its own merit. There was no suggestion that one rule could apply to all.

Despite disapproving comments and discussions, some positive ideas emerged. One of the councillors of the Wagga Wagga City Council suggested the following:

Cross-boundary farming may be an appropriate venture for the land holders on the East Bomen Road and may reduce noxious weeds. Councillor W. also suggested that the introduction of community title could be considered in the Local Environmental Plan review in order to provide the community the opportunity to jointly purchase community land. Thus individuals could be joint shareholders in ventures from environmental initiatives to farming (Wagga Wagga City Council, October 2007).

After several attempts to find out whether any action had been taken regarding this proposal, a reply included the following messages:

Council's previous Local Environmental Plan and Development Control Plan do not indicate that provisions were implemented for Cross Boundary Farming in 2007.

In addition, Council's introduction of a new Wagga Wagga Local Environmental Plan and Development Control Plan in 2010 has no provisions for Cross Boundary Farming (Wagga Wagga City Council, 2012).

A more positive outcome had been anticipated. In a way, the answer of the Wagga Wagga City Council covers the lesson learned from the forum: no change in attitude or behaviour is likely. There was consensus amongst the participants that productivist farming methods need to be changed so that rural sustainability and maintenance of the family farm can be achieved, however, the way in which to achieve this could not be determined. The common property resources system was not appealing because of legal implications and inherent difficulties, but the loss of the farmer's independence seemed to be of equal importance for not wanting to implement the system.

The above forum took place in 2007. Since then, further droughts and floods have devastated Australian farmlands. Have these natural disasters changed the attitudes of farmers? According to Don Boadle (personal communication, June 2012), a workshop on *The*

Future of Family Farming was held in June 2012 in Wagga Wagga. Boadle reported that the meeting was well attended by local residents. Most participants were interested in succession planning and joint ventures, mainly based on leasehold that stopped short of common property system arrangements. There was also anecdotal evidence of collaborative arrangements among farmers on the Northern Table Lands in New South Wales, typically involving joint purchase of expensive plant and equipment. According to Boadle there is, at this point in time, no indication that the Australian farmers are prepared to surrender their independence and individuality to take up a system that will restrict them, even though it may provide some relative advantage.

The pessimistic attitudes at these two meetings are similar to those experienced by Brunckhorst and Marshall (2006, pp. 191-219) (as discussed earlier). These authors stipulated circumstances, conservatism and time as important reasons for farmers not wanting to commit to common property resources system:

1. Circumstances need to be such that a critical mass of farm businesses are ready to embrace the concept at the same time. Negotiations take years, circumstances improve, people with whom they would like to work leave the area (p. 205).
2. Conservatism: due to their conservatism farmers need considerable time to change their attitudes. They see themselves as rugged individualists and changes to attitudes of this nature do not occur overnight (p. 206).

The outcome of the meetings indicates the division between academia and the farming industry.

5. Discussion

The findings of this research suggest that many Australian farming families are struggling to survive because of fluctuating markets, ten years of drought and two years of major flooding. The number of family owned farming businesses has declined substantially during the last thirty, forty years, and the social fabric of the farming industry is deteriorating within the global, competitive market system. Australian farming was previously linked to a lifestyle, today farming has to be considered within the market-driven global society as business.

Considering the environmental, economic as well as individual difficulties experienced by farming families, it was expected that some joint venture would be appealing to the Australian farming sector. However, this assumption is incorrect. Independence is highly valued and many farmers prefer to get out of the farming industry, are trying to find employment either in a related field, (managing a farm for someone else, work as farm labourer or in feedlots) or elsewhere in the labour market. An example is the story of a student: He was a fourth generation dairy farmer who was greatly disappointed with the overall system⁹, discouraged by the year long drought, sold the business, and started to study. He successfully completed a PhD

and is now employed as an academic. When asked whether he would have liked to enter into a common property resources system, his answer was a categorical *no*. It has to be realised that not every farmer will have the opportunity of such a career change, however, it is hard to determine a system that would prevent a small scale farmer from leaving his/her property. Family farming has been an important aspect of the Australian economy, and, unless more transnational and corporate farming businesses are accepted¹⁰, will remain an essential part of society. But, as Pannell et al. (2006) established, innovations are likely to be adopted only when they have a high “relative advantage” (p. 1407), indicating that economic factors drive their decisions (p. 1411). Similar opinions were established by Brunckhorst and Marshall (2006, pp. 205-206) when they tried to introduce group farming (embedded in the common property resources system) in the *Furracabad Valley* in New South Wales. These authors determined that conservatism of the farming community plays a significant part of not wanting to change habits.

Where to from here? The lesson learned in relation to rural sustainability and the maintenance of the family farm is that corporate farming is not a viable option: the financial resources are not available. Co-operative farming also presents the problem of investment: in its present form it cannot support the family farm and restructuring of the agricultural sector needs substantial amounts of additional capital which would lead to new co-operative forms (Oczkowski, 2006). Since the rules of the common property resources system seem not practical or are too challenging for farming families, here are some thoughts that advocate improved sustainability of the land which would, in turn, mean a chance to maintain the family farm (economic and ecological benefits). It is the so-called adaptive ecosystem management network which is described by Manring and Pearsall (2006). The system requires networking between public, private, and non-profit organisations. It is called inter-organisational networking, and is a system that does not involve legal processes but good will, trust, reciprocity and organisational learning, it is consensus building through collaboration. Applying the system to the Australian farmers, they would have to make “balanced, multivariable decisions about how best to conserve ecosystem integrity while sustaining ecosystem services” (n. p.). Individual farmers have specific interests and knowledge in relation to the sustainability of the land and expectation of maintaining the family farm, all of which they could negotiate with other stakeholders. The system would include the *public*, which is interpreted here as meaning an official organisation, i.e. the appropriate council; the *private*, which is interpreted here as meaning members of the farming family, and *non-profit* stakeholders, meaning other farmers or landholders. All of these people would form an inter-organisational network. Working with the council may provide input into future planning, so may negotiations with non-profit stakeholders. Manring and Pearsall (2006) find that these networks are the basis of “many ecosystem management initiatives”, using “certain forms of network and collaborative decision making” (n. p.), the outcome would be a sustainable environment.

⁹ The squeeze of the price for milk by large supermarkets

¹⁰ Chinese foreign investment into the farming industry is at present vigorously debated.

Looking at the Australian farmers, they will lose some of their highly valued independence and individuality. On the other hand, it could be argued that the conservation of the environment is very important, that anthropogenic land cover change (removal of native plants and using the land for farming) had a significant effect on the global and regional climate (McAlpine, Syktus, Deo, Lawrence, & McGowan, 2007, p. 1) which, in turn, produced droughts and flooding. Extending this argument, land degradation could be reduced if groups of farmers used their social capital and would network to look after the environment, i.e. improve sustainability. *The Tilbuster Commons* definitely demonstrated several positive ecological and economic outcomes.

6. Conclusion

The findings of this research did not put my mind at rest regarding concerns about rural sustainability and the future of the Australian family farm. Ten years of drought and major floods between 2000 and 2012, findings in the literature, as well as attitudes at meetings regarding the future of family farming, justify the concern. Participants at the meetings were concerned about income and succession but did not seem to be overly concerned regarding the environment and committed to change practices. So how can rural sustainability be achieved and the family farm be maintained? One fundamental aspect of the common property resources system was to improve the ecology, which was achieved, as scientific studies demonstrated. Further, economic profits as well as individual and collective benefits could be realised. The system seemed like an appropriate solution considering the struggle of small scale farming enterprises. But research suggests that such a system is based on principles and rules that need to be followed strictly in order to function which makes implementation difficult. The Australian farming community is very conservative: individualism and independence are important aspects of their psychological make-up, which were major reasons for objecting to the common property resources system. On the other hand, changes in the farming industry are necessary. But what changes should be aimed for? If we are looking at issues from a neoliberal perspective, progress and change can result from letting the market operate freely. Here progress is seen as increased production, which supports a large part of the population as financial growth, produced by economic freedom, trickles down to socio-economically disadvantaged populations (Boutilier, 2009). But environmentalists (McAlpine et al., 2007) and people especially concerned about rural sustainability (Barr et al., 2005; Brunckhorst, 2002b; Institute for Self Reliance, 2009; Manring & Pearsall, 2006; Marshall et al., 2005; Ostrom, 1990; Pannell et al., 2006; Smajgle & Larson, 2006; Williamson et al., 2003) alert us that greater caution must be taken if sustainability is to be achieved. Sustainable development has, according to the World Commission on Environment and Development (WCED, 1987), to meet “the needs of the present without compromising the ability of future generations to meet their own needs” (p. 8). The point here is that Australia does not seem to be on the correct path. Efforts have been made to improve sustainability and reduce the social costs of farming by promoting structural change in agriculture, however,

Conventional attempts to address these issues are hampered too frequently by an entrenched narrow focus on individual property rights... as well as by institutional arrangements implemented at inappropriate scales for sustainable landscape futures (Brunckhorst & Marshall, 2006, p. 191).

It is difficult to provide any practical suggestions which are acceptable to the farming community. This research found a clear divide between academic discourse and the pragmatic perspective of the farming industry. The key variables of the common property resources system, i.e. salience and heterogeneity (Brown, 2006, pp. 56-75), may have a different meaning and are of different importance to various groups of people. This leaves the author of this chapter rather dispirited. Does it mean that the farmers and landholders should be left alone to deal with their problems? But how can we? The important issues of rural sustainability and the family farm have not been solved, they remain problems. Given the structural conditions of the Australian economy and the larger global food economy, Australian farmers must carefully decide how to achieve rural sustainability. He or she may restructure vertically or horizontally, or may sell the property so that it can be integrated into a corporate business. Will rural sustainability be achieved? Time will tell.

Acknowledgements

I would like to thank my colleague, Don Boadle, for his thought-provoking input into this chapter; it is greatly appreciated and resulted in some stimulating discussion. I would also like to thank Professor D. Brunckhorst, University of New England, for allowing me to use the graph of the *Tilbuster Commons*. Neil Clark, Rural Market Development, Bendigo, deserves special recognition for being extremely helpful to find data on corporate farming enterprises. Ms Viktorija Zgela, the commissioning editor's expertise on all things technical, warrants appreciation: her thoughtful notes came at times when things were a little hectic. Last but not least, the guidance and advice of the referee / editor is also gratefully acknowledged.

Author details

Ingrid Muenstermann*

Charles Sturt University, Wagga Wagga, Australia

References

- [1] ABC Australian Broadcasting Corporation (2001). *Landline Program: Communal Farming Revival under Way*.

- [2] ABC Rural Australian Broadcasting Corporation. (December 29, 2010). Farm and mine economy lashed by floods. Retrieved from www.abc.net.au/rural/news/content/201012/s3103077.htm.
- [3] ABS Australian Bureau of Statistics. (2012). *Agricultural Commodities, Australia, 2010-11*, Cat. 7121.0. Release 29.6.2012. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/Products/7121.0~2010-11~Main+Features~Industry+Structure?OpenDocument>.
- [4] ABS Australian Bureau of Statistics 2006, Census of Population and Housing. *Customised Data Report. Table 1: Farming families (a) Census years 1971, 1976, 1981, 1986, 1991, 1996, 2001, 2006* Reference.
- [5] ABS Australian Bureau of Statistics. (2003). Australian Social Trends, 2003. Living arrangements: Farming families. Cat 4102.0. Retrieved from <http://www.abs.gov.au/Ausstats/ABS@nsf/7d12b0f6763c78caca>
- [6] Alston, M. (2004). Who is down on the farm? Social Aspects of Australian Agriculture in the 21st Century. *Agriculture and Human Values*, 21, 37-46.
- [7] Alston, M. (1995a). *Women on the land*. Sydney: University of New South Wales Press.
- [8] Alston, M. (1995b). *Women and their work on Australian farms*. *Rural Sociology*, 60(3), pp. 521-532.
- [9] Alston, M. (1991). *Farming Families, Australia and New Zealand. Key Papers Number 2*. Wagga Wagga, NSW: Centre for Rural Social Research, Charles Sturt University.
- [10] Alston, M. & Kent, J. (2004). *Social impact of drought: A report in NSW Agriculture*. Wagga Wagga, NSW: Centre for Rural Social Research, Charles Sturt University.
- [11] Australian Co-operative Links, Australian co-operatives. Australian Agricultural and Fishing Co-operatives. Retrieved from <http://www.coop.development.org.au/aglinks.html>.
- [12] Australian Natural Resources Atlas. (2002). *Australian farmers. Relating to natural resource management*. Australian Government. Retrieved from <http://www.anra.gov.au/topics/economics/pubs/national/anrm-report/farmers>.
- [13] Barr, N., Karnuarama, K. & Wuilkinson, R. (2005). *Australia's farmers: past, present and future*. Canberra: Australian Government, Land & Water Australia Report.
- [14] Bijman, J. (2002). *Essays on agricultural co-operative: governance structure in fruit and vegetable chains*. Rotterdam: Erasmus Research Institute of Management. Retrieved from <http://www.dspace.ubib.eur.nl/handle/1765/867>.
- [15] Boadle, D. (2012, June 20). *The Future of Family Farming*, Wagga Wagga. Personal communication, July 2012.
- [16] Boutilier, R. (2009). *Stakeholder politics. social capital, sustainable development, and the corporation*. Stanford Business Books. California: Stanford.

- [17] Briton, B. (2005, August 31) Big changes down on the farm, *The Guardian*, p.28.
- [18] Brown, K. M. (2006) The Challenge of Maintaining the Salience of Common Property Rights with Increasing Cultural and Socio-economic Heterogeneity. In Smajgl, A., & Larson, S. (2006). *Adapting Rules for Sustainable Resource Use*. Townsville, Australia: CSIRO Sustainable Ecosystems Laboratory.
- [19] Brunckhorst, D., & Marshall, G. R. (2007). Designing robust common property regimes for collaborative arrangements towards rural resource sustainability, pp. 179-207. In: *Sustainable Resource Use: Institutional Dynamics and Economics*. London: Earthscan.
- [20] Brunckhorst, D. J., & Marshall, G. R. (2006). Designing Robust Common Property Regimes for Collaboration towards Rural Sustainability. In Smajgl, A., & Larson, S. *Adapting Rules for Sustainable Resource Use*. Townsville, Australia: CSIRO Sustainable Ecosystems Laboratory.
- [21] Brunckhorst, D. (2005). Integration research for shaping sustainable regional landscapes. *Journal of Research Practice, Article M7*, 1(7), 16-28.
- [22] Brunckhorst, D., Coop, P., & Reeve, I. (2005). *'Eco-civic' optimisation: a nested framework for planning and managing landscapes*. Armidale, NSW: Institute for Rural Futures, UNESCO Centre for Bioregional Resource Management, University of New England.
- [23] Brunckhorst, D. (2003). *Creating a Contemporary Common Property Resource (CPR) Management Institution. Final Report to Land & Water Australia on UNE 40*. Armidale: Institute for Rural Futures.
- [24] Brunckhorst, D. J., & Coop, P. (2003). Tilbuster commons: synergies of theory and action in new agricultural commons on private land. *Ecological Management and Restoration*, 4(1), 13-22.
- [25] Brunckhorst, D. (2000). *Bioregional planning: resource management beyond the new millennium*. Australia: Harwood Academic Publishers.
- [26] Chaddad, F. & Cook, M. (2002). *An ownership rights typology of co-operative models*. Columbia, MO: University of Missouri, Department of Agricultural Economics Working Paper No. AEWP 2002-06. Retrieved from <http://academic.research.microsoft.com/Paper/5644018.aspx>.
- [27] Clark, N. (2012). Statistics *Top Farming Enterprises, Top Grain Enterprises, Largest Beef Cattle Producers, Largest Flocks, Largest Dairy Producers*. Email correspondence 16.10.2012. Bendigo: Neil Clark & Associates.
- [28] Clark, N. (2008). *Press Release regarding Corporate Farming*. June 2008. Bendigo, Victoria: Neil Clark & Associates.
- [29] Co-operative Development Services, Australian Co-operative Links. (2012). Retrieved from <http://www.coopdevelopment.org.au/aglinks.html>.
- [30] Coop, P., & Brunckhorst, D. (2000). Creating contemporary commons to enhance economic productivity: a grazing commons in rural Australia. *The whole is greater than*

the sum of parts – Assembling new commons from private parcels. Panel Paper. Bloomington: IASCP, University of Indiana.

- [31] Gray, I. (1991). Family Farming and Ideology: Some Preliminary Exploration. In M. Alston (Ed.). *Farming Families, Australia and New Zealand. Key Papers Number 2*. Wagga Wagga, NSW: Centre for Rural Social Research, Charles Sturt University.
- [32] Griffiths, D. (2008). The winds of change, *Co-Op Advocacy*. Apr 21. Retrieved from http://www.australia.coop/artman2/publish/Co-op_Advocacy_19.
- [33] Hajkowicz, S. A. (2006). Reinventing the Common. Book Review. *Australasian Journal of Environmental Management*, 13(2), 131-132.
- [34] Hardin, G. (1998). *Extension of the tragedy of the commons*. Published by the American Association for the Advancement of Science. Retrieved from http://www.garretthardin.society.org/articles/art_extension_tragedy_commons.html.
- [35] Hardin, G. (1991). The tragedy of the unmanaged commons. In R.V. Andelson (Ed.). *Commons without tragedy. Protecting the environment from overpopulation – A new approach*. London: Shearheard-Walwyn.
- [36] Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1243-1248.
- [37] Institute for Local Self-Reliance (2009). *Banning corporate ownership – South Dakota*. Retrieved from <http://www.newrules.org/agri/banning.html>
- [38] Manring, S. L., & Pearsall, S. (2006). Creating an Adaptive Ecosystem Management Network among Stakeholders of the lower Roanoke River, North Carolina, USA. *Ecology and Society*, 10, 2, 16 [online]. Retrieved from <http://www.ecologyandsociety.org/vol10/iss2/art16/>
- [39] Marshall, G. R., Fritsch, S. J., and Dulhunty, R. V. (2005). Catalyzing common property farming for rural sustainability: Lessons from the Furracabad Valley. *Australian Agribusiness Review*, 13, paper 17. Retrieved from http://www.agrifood.info/review/2005/Marshall_et_al.html
- [40] Marshall, G. R. (2004). Farmers cooperating in the commons? A study of collective action in salinity management. *Ecological Economics*, 51, 271-286.
- [41] McAlpine, C. A.; Syktus, J.; Deo, C.; Laurence, P. J., & McGowan, H. A. (2007). Modeling the Impact of Historical Land Cover Change on Australia's Regional Climate. *American Geophysical Union*, 34, L22711. Doc:10.1029/2007 GL031524, 2007.
- [42] Meinzen-Dick, R. (2008). Commons Forum Commentary. *Commons Digest*, 7, 1-4.
- [43] Muenstermann, I. (2011). Too bad to stay or too good to leave? Two generations of women with a farming background – what is their attitude regarding the sustainability of the Australian family farm? In: G.W. Luck, D. Race & R. Black (Eds.) *Demographic change in Australia's rural landscapes*. Dordrecht: Springer.

- [44] Muenstermann, I. (2010). Where the crows fly backward and women explore their choices. In: N. Blacklow & T. Whitford (Eds.) *Where the crows fly backwards: notions of rural identity*. Brisbane: Posted Press.
- [45] Muenstermann, I. (2009). Cross Boundary Farming: Can this Challenging Farming method Save the Australian Family Farm? *Rural Society*, 19(3), 262-274.
- [46] National Farmers Federation. (2012). *Farm Facts 2012*. Retrieved from <http://www.nnf.org.au/farm-facts.html>.
- [47] Oczkowski, E. (2006). New agricultural co-operative models. Sydney: Centre for Australian Community Organisations. Retrieved from <http://www.business.uts.edu.au/cacom/articles/commentaries/agricultural.html>.
- [48] Oczkowski, E. (2004) *Nash Bargaining and Agricultural Co-operatives*. Bathurst: Charles Sturt University.
- [49] Ostrom, E. (2006) Multiple Institutions for Multiple Outcomes. In Smajgl, A., & Larson, S. *Adapting Rules for Sustainable Resource Use*. Townsville: CSIRO Sustainable Ecosystems Laboratory.
- [50] Ostrom, E. (1990a). *Governing the Commons. The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.
- [51] Ostrom, E. (1990b). *Summary of Governing the Commons. The Cooperation Commons*. CoCo The Cooperation Commons. Retrieved from <http://www.cooperationcommons.com/node/361>.
- [52] Pannell, D. J., Marshall, R. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006). Understanding and Promoting Adoption of conservation Practices by Rural Landholders. *Extension. Australian J of Experimental Agriculture*, 46, 1407-1424. CSIRO.
- [53] Raven, R. (1995, September 14). Farewell to the family farm. *Green Left News*. Retrieved from <http://www.hartford-hwp.com/archives/24/117.html>.
- [54] Reeve, J. (2001). Uniqueness of the family business: the relationship between family resilience in business and success. *The Regional Institute*, Rockhampton: Department of Primary Industry. Retrieved from <http://www.regional.org.au>,
- [55] Share, P., Lawrence, G., & Gray, I. (2005). Rural Australia. In: J.M. Najman & John S. Western. *A Sociology of Australian Society*. South Melbourne: Macmillan.
- [56] Share, P., Campbell, H., & Lawrence, G. (1991). The vertical and horizontal restructuring of rural regions: Australia and New Zealand. In: M. Alston (Ed.). *Family Farming Australia and New Zealand. Key Papers Number 2*. Wagga Wagga: Centre for Rural Social Research.
- [57] Short, C. (2008). The traditional commons of England and Wales in the twenty-first century: meeting new and old challenges. *International J of the Commons*, 2(2), 192-221. <http://www.thecommonsjournal.org>.

- [58] Smaijl, A., & Larson, S. (2006). *Adapting Rules for Sustainable Resource Use*. Townsville: CSIRO Sustainable Ecosystems Laboratory.
- [59] Tanewski, G.A., Romano, C.A. & Smyrniotis, K.X. (2000). *Determinants of Australian family farm growth*. Barton, ACT: Rural Industries Research & Development Corporation.
- [60] Tont, M., Halpin, D., Collins, J. & Black, A. (2003). *Rural communities and changing farm business structures*. Report for the Rural Industries Research and Development Corporation, RIRDC Publication 03/126. Barton., ACT: Rural Industries Research and Development Corporation.
- [61] Von Pischke, J.D. & Rouse, J.G. (2004) *New Strategies for mobilizing capital in agricultural co-operatives*. Rome: Food and Agriculture Organization of the United Nations.
- [62] Wagga Wagga City Council. (15 August 2012). Correspondence to Dr Ingrid Muenstermann. Reference 2861202.
- [63] Wales, Kevin. (2007). Councillor at Wagga Wagga City Council. *Council Meeting October 2007, Question QS7. Cross Boundary Farming*.
- [64] Waters, Cara. (June 26, 2012). The end of the family farm? 72% of family farms don't earn enough to support the family on them. Smart Company. Retrieved from <http://www.smartcompany.com.au/agribusiness/050379>
- [65] WCED World Commission on Environment and Development. (1987). *Our Common Future*. Oxford: Oxford University Press.
- [66] Wickremaratchi, J. (2003). *New co-operatives: motivations and barriers*. Accord Paper No. 10. Bathurst, NSW: Charles Sturt University.
- [67] Williamson, L. (1987). *The farmer's co-operative yardstick: co-operative mergers, acquisitions and other forms of restructuring*. AEC-58. Lexington, KY: University of Kentucky, Department of Agriculture Economics. Retrieved from <http://www.ca.uky.edu/AgEcon/pub/php?p=613>.
- [68] Williamson, S., Brunckhorst, D., & Kelly, G. (2003). *Reinventing the Common: Cross-Boundary Farming for a Sustainable Future*. Sydney: Federation Press.
- [69] www.fatcow.com.au/c/Fatcow-www-com-au/ABARES-assesses-impact
- [70] www.record.nsw.gov.au/state/archives/resources-for/people/in-regional-nsw/regional-repositories/armidale-regional-archives-repository
- [71] www.southdevon-cattle.com.au/armidale.htm

