

Understanding the social context of land-use in the Boorowa catchment

Lessons for measuring and managing the social implications of changes in rural land-use

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Albury

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EXECUTIVE SUMMARY

Meshed with the bio-physical and economic dimensions of rural land-use, is a social dimension. Recognising that the appearance of most catchments is strongly shaped by human activity, efforts to improve natural resource management (NRM) requires an understanding of the social qualities of the landscape – people’s historical and current activities, their values, capacities and aspirations.

Researchers from Charles Sturt University (CSU) have worked with DPI researchers, Lachlan Catchment Management Authority staff and other partners during 2005-07 to undertake a project that:

1. identified the social impacts of current land-use change in the Boorowa catchment at both the landholder and community scales;
2. identified feasible and socially acceptable pathways to achieving the change in land-use required to manage land degradation, with a focus on dryland salinity; and
3. constructed and refined an effective and efficient methodology for assessing the social and economic impacts of changes in land-use at the catchment scale, for potential application in other catchments.

The contemporary Boorowa landscape (the people and land-use) has a long and prosperous heritage centred upon fine wool production. However, this research has revealed a district undergoing considerable socio-economic and demographic change – a community at the nexus of some of the powerful forces reshaping rural and regional Australia. For example, the population in the Boorowa district has declined by 8% and the median age has increased by 21% during the period of 1986-2001. However, agriculture remains an important sector for employment in the Boorowa LGA, representing 59% of employment for men and 34% of employment for women in 2001.

Yet when looking more closely at parallel research, over recent years there has been an increase in the number of rural properties, a decrease in the size of rural properties, fewer landholders identifying themselves as farmers, and a high exit rate from farming – indicating that ownership of rural land is uncoupling from agriculture.

New landholders moving into the Boorowa district appear to have less dependence on agriculture, yet are willing to pay high land prices for the district’s ‘agricultural’ landscape and sense of community. Even amongst commercial farmers, many reported off-farm income was important to a family’s household budget, and for many landholders off-farm income had become an established component of their household income and was not simply a temporary income source.

Important socio-economic indicators of a landholder’s capacity and willingness to undertake land-use change include the level of household income and its dependence on agriculture, preferred lifestyle and long-term plans. The low level of income from farm enterprises on an averaged-sized grazing property in the Boorowa district indicates that many landholders are unable to invest in the recommended practices for improving the management of farmland. While commercial farmers in the Boorowa district could be expected to be interested in applying lime to improve the growth of perennial pastures, few farmers would have the available funds in the current context to pursue this option on an appreciable scale.

Boorowa landholders reported that their futures are largely determined by external forces, with their current lifestyle and property management governed by meeting a mix of short-term challenges. Most landholders interviewed were very uncertain about how their property would be managed in 5-10 years time.

This research revealed that few landholders in the Boorowa district share the agencies’ view that salinity is a critical threat to landscape health. Research also indicated that if the purchase price of farmland far exceeds the property’s agronomic potential, then it is likely that land is being purchased for reasons other than commercial farming. Where farmland is close to centres of high population growth, it is likely to be valued less for its agronomic potential and increasingly for its potential for small ‘lifestyle’ farms or urban development. When the value

of land goes beyond its agronomic potential it is likely that there will be changes in the farm's management.

Part of the aesthetic appeal of the rural landscape is the presence of a viable agricultural industry, yet there is also a growing demand for small 'lifestyle' properties and to protect and improve the environmental assets of a region for residents and tourism – a demand for landscapes to be multi-functional.

The future for NRM agencies is challenging on a number of fronts – biophysical, socio-economical and policy. Using the socio-economic indicators outlined in this report, and adoption of the cost-efficient approach to data collection and analysis, NRM agencies can provide leadership in understanding the important socio-economic dimensions of NRM.

OVERVIEW OF RESEARCH PROJECT

Meshed with the bio-physical and economic dimensions of rural land-use, is a social dimension. Understanding the social dimension of rural communities is critical if agencies are to develop effective policies and programs to improve natural resource management.

The New South Wales (NSW) Department of Primary Industries (DPI) received funds under the National Action Plan (NAP) for Salinity and Water Quality to identify the social and economic impacts at the farm and community scale of salinity management options. Working in the Boorowa catchment, located in the Southern Highlands of NSW, economic analyses have identified deep-rooted perennial pastures (lucerne) and trees as the most feasible options to achieve the desired reduction in 'excess water' (difference between precipitation and evapotranspiration) required to mitigate dryland salinity.

Researchers from Charles Sturt University (CSU) have worked with DPI researchers, Lachlan Catchment Management Authority (CMA) staff and other partners to undertake a project that:

1. identified the social impacts of current land-use change in the Boorowa catchment at both the landholder and community scales;
2. identified feasible and socially acceptable pathways to achieving the change in land-use required to manage land degradation, with a focus on dryland salinity; and
3. constructed and refined an effective and efficient methodology for assessing the social and economic impacts of changes in land-use at the catchment scale, for potential application in other catchments.

The research process involved assessing available data for constructing community and landholder profiles; conducting workshops with different community groups to explore their long-term goals and concerns about salinity; and developing indicators of social processes and progress that CMA may be able to use in their decision-making processes.

SECTION 1: SOCIO-ECONOMIC PROFILE OF THE BOOROWA CATCHMENT

The socio-economic profile of the Boorowa catchment has been developed to provide New South Wales Department of Primary Industries (NSW DPI) and its partners an enhanced understanding and, therefore, a capacity to predict the likely responses of individuals and groups to strategies to address the degradation of natural resources, including the effects of salinity. This profile was largely prepared during 2005, and revealed a district undergoing considerable socio-economic and demographic change – a community at the nexus of some of the powerful forces reshaping rural and regional Australia.

The town of Boorowa was established around the year 1830, and is situated three hours drive from Sydney and only one hour from Canberra on the major road – the Lachlan Valley Way. The Boorowa Shire Council (BSC) (2005) describes the district “... as ‘God’s Country’ with its quiet lifestyle and picturesque countryside”. The contemporary social and physical landscape of the Boorowa area reflects a strong and prosperous agricultural heritage with it “... being one of the best fine wool sheep growing areas in Australia” – a sign at the entrance of town states ‘Home of Australia’s Best Merino Sheep’ (BSC, 2005). Despite the obvious legacy of agriculture, it is uncertain if the Boorowa people and land-use remain as closely linked to the agricultural sector as previously – the core issue this socio-economic profile of Boorowa aims to explore.

The contemporary Boorowa landscape – the people and land-use – has a long and prosperous heritage centred upon fine wool production.

In particular, this catchment profile aims to address the following questions:

- What have been the major socio-economic and demographic changes since the 1980’s?
- How reliant are households on agricultural industries for their income?
- Does the Boorowa catchment reflect an ‘agricultural’ landscape (ie. primarily shaped by agricultural industries)?
- Are the trends in the Boorowa catchment consistent with other rural NSW regions?
- What are the key factors (drivers) causing this change?

The Australian Bureau of Statistics (ABS), on behalf of the Australian government, periodically collects a wide range of data from each household – known as the Census of Population and Housing, with data compiled at several geographical scales. A useful scale for data analysis to inform natural resource management is at the Local Government Area (LGA). A range of ABS data that was collected in the Census of 1986, 1991, 1996 and 2001 has provided a useful foundation for this socio-economic profile of the Boorowa area. While the latest Census was conducted on the 8th August 2006, data at the LGA scale is not expected to be released until mid-2007.

Data from the ABS has been cross-referenced and enriched with information derived from 15 individual semi-structured interviews with a range of people within the Boorowa area, including landholders, business operators and agency staff. This approach of combining statistical data with information derived from targeted interviews is viewed as a reliable and cost-efficient method for generating a socio-economic profile. The socio-economic and demographic variables focused upon for this catchment profile include:

- changes in population size and composition;
- scale and composition of employment;

- composition of households; and
- the dependence on agriculture for employment.

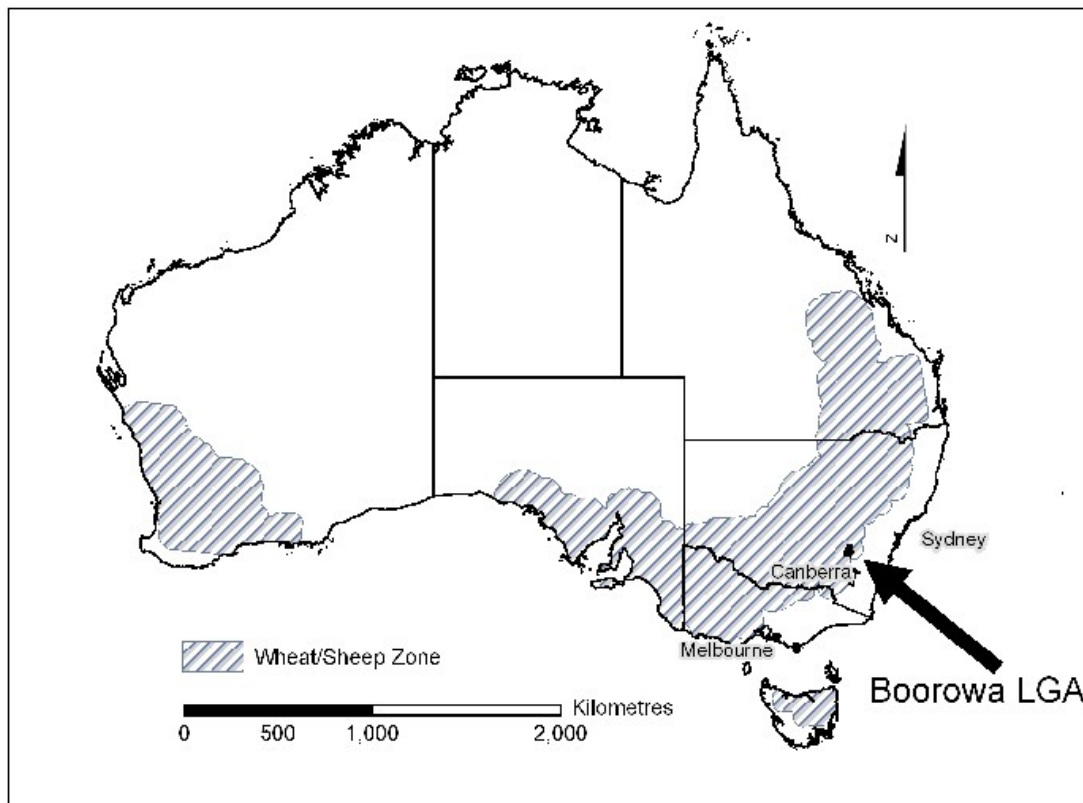
These variables were selected as they draw on available data and have been informative in previous studies (Curtis *et al.*, 2003; Charalambou and Curtis, 2003; Webb and Curtis, 2002).

OVERVIEW OF THE BOOROWA AREA

The geographic centre of the Boorowa LGA (LGA code: 11050) is located approximately 120 km north of the capital city of Canberra (population of 350,000) and approximately 120 km south of the regional centre of Orange (population 35,000) – within the south-west slopes of NSW. The Boorowa area is also contained within the priority region of ‘Lachlan-Murrumbidgee’, one of 22 regions identified in the National Action Plan for Salinity and Water Quality (NAP) (DAFF, 2004), and broadly classified as part of Australia’s ‘wheat/sheep’ zone (ABARE, 1999) [refer to Figure 1, below].

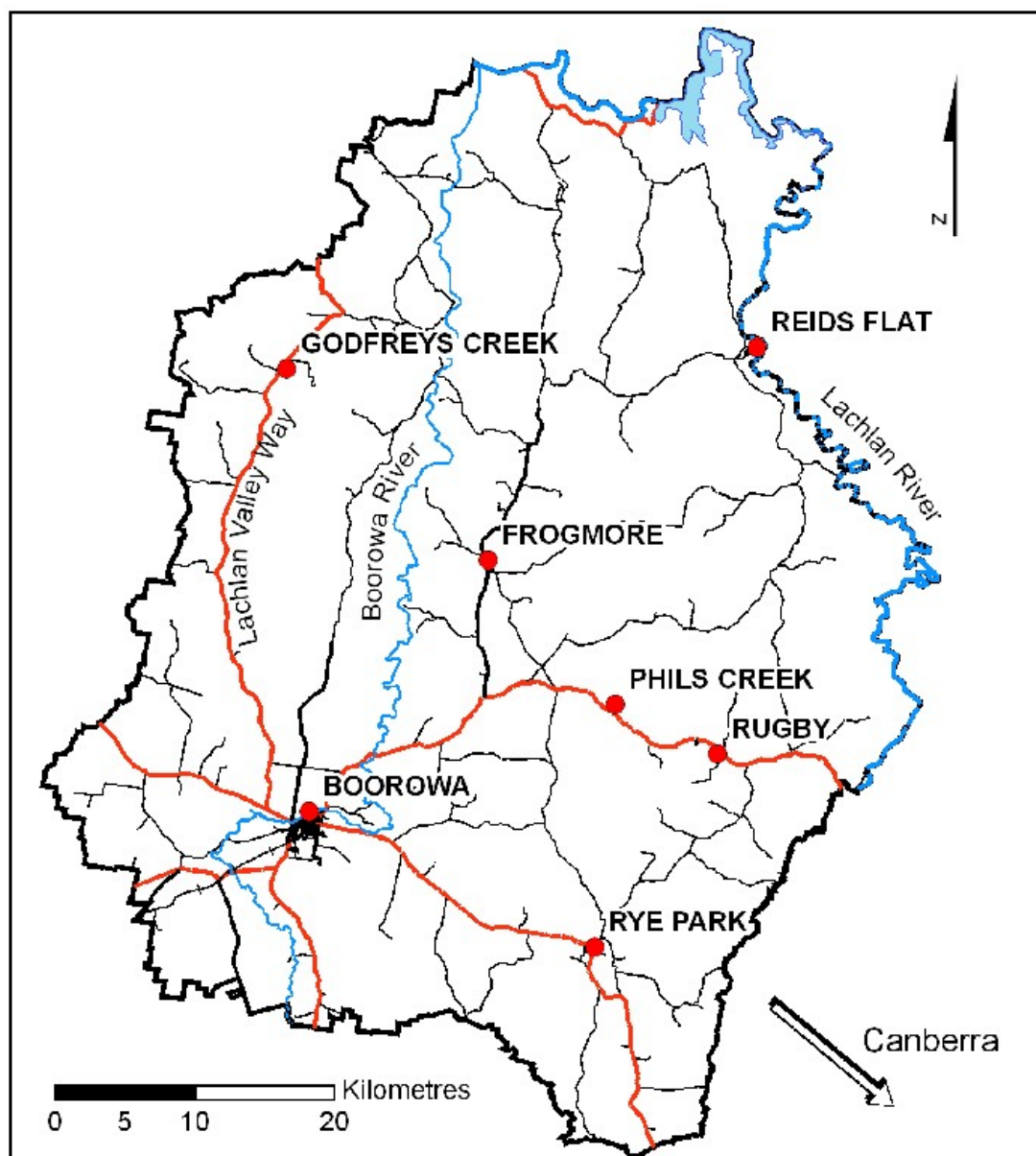
It is estimated that the Boorowa LGA has a 65% coincidence with the Boorowa catchment or watershed (as defined by the Resource Information Unit – NSW Agriculture, January 2004). As such, the data available for the Boorowa LGA is considered useful in terms of informing NSW DPI and other stakeholders about the likely socio-economic capacity of the local community to respond to natural resource management (NRM) strategies.

Figure 1 Locality of Boorowa and ‘wheat/sheep’ zone



The Boorowa LGA covers an area of 2,578 km², and includes the small towns (population less than 1,000) of Boorowa, Godfrey Creek, Frogmore, Phils Creek, Rugby and Rye Park, and has total population of 2,333 (ABS, 2001) [refer to Figure 2].

Figure 2 Boorowa Local Government Area



POPULATION CHANGES

The total resident population in the Boorowa LGA has declined by 8% during the 15-year period of 1986-2001 [refer to Table 1]. This decline in population contrasts with the median population figures for LGAs in rural NSW, which saw an average increase of 4% in population over the same period (1986-2001, ABS, 2001). Yet at a national level, the population increased by 11% during 1991-2001 (ABS, 2005).

Table 1 Boorowa and all rural NSW LGA populations, 1986-2001

Total population in LGA's	1986	1991	1996	2001
Boorowa	2520	2449 (-3%)	2376 (-3%)	2333 (-2%)
Median of all rural NSW	6241	6328 (+1.5%)	6523 (+3%)	6486 (-0.5%)

Source: Australian Bureau Statistics 2001

Note: percentage change from previous census indicated in parenthesis

It is important to note that the considerable increase in population for many LGA's along the coast of NSW is likely to mask an overall pattern of decline of population for inland rural NSW LGA's. At the broad national level, in 2001 85% of Australia's population resided within 50 km of the coast – largely south-east Queensland, New South Wales and Victoria (ABS, 2001).

The population decline of 8% in the Boorowa area during recent decades is a critical demographic change, as population decline is strongly associated with a loss of health and welfare services (public and private), decline of community groups (loss of critical mass of volunteers, less membership renewal, less group vitality), and a decreasing demand for goods and other services, therefore reduced local economic activity (McManus and Pritchard, 2000).

The population in the Boorowa area has declined by 8% over a 15-year period since the mid-1980's, despite an increase in the NSW and national populations.

Across Australia, small towns (less than 1,000) have been more likely to decline in population than large towns (greater than 5,000) over recent decades (Tonts, 2000). Given that the Boorowa LGA is comprised of only small towns, it is not surprising that it has seen a population decline in line with this national trend.

An important age cohort in a community is the 'youth' segment (15-24 years of age), as it generates a high demand for late-secondary and post-secondary education, and training services (Curtis *et al.*, 2003). Also, the 15-24 year old cohort may have a high proportion of 'disposable' income, low levels of debt, and less likely to have dependents compared to other age cohorts – overall, a decline in the youth population indicates an area's inability to provide the desired education and employment opportunities relevant to this age group (Kirstein and Bandranaike, 2004). Interviewees reported that there was a decline in the number of young people because of the lack of employment, both in town and on farms. They added that most young people leave Boorowa for Canberra to pursue employment, education and sporting interests – with some young people commuting back to Boorowa for weekends.

In the Boorowa LGA, there has been a significant decline in the size of 15-24 year old cohort, with a decline of 32% over the period 1986-2001. This is a substantially higher rate of decline than that experienced by all LGA's in rural NSW, with a decline of 18% during the same period [refer to Table 2].

Table 2 LGA population of 15-24 year old cohort, 1986-2001

LGA population of 15-24 year olds	1986	1991	1996	2001
Boorowa	313	257 (-18%)	225 (-12%)	213 (-5%)
Median of all rural NSW	854	788 (-8%)	738 (-6%)	704 (-5%)

Source: Australian Bureau Statistics 2001

Note: percentage change from previous census indicated in parenthesis

There was a decline by 32% in the size of the 15-24 year old population during 1986-2001 within the Boorowa LGA, reducing demand for secondary education and training services.

There was a decline in the annual birth number and rate (proportion of total population) in the Boorowa LGA during 1999-2003, with 22 births at a rate of 9% during 2003 (37 births at 14.8% in 1999; ABS, 2003). Given the decline in birth numbers and the decline in the 15-24 year old age group, it is not surprising that the population of the Boorowa LGA is ‘ageing’ – with an increase in the population’s median age of 33 years to 40 years, during the period of 1986-2001 (an increase of 21%). This increase in median age is greater than the 12% increase in the median age for all LGA’s in rural NSW over the same period [refer to Table 3]. An increase in the median age of a local population has direct implications for the demand for health and welfare services, and home care services. Interviewees reported that the people moving to the Boorowa area tended to be older people without children.

Table 3 LGA population median age, 1986-2001

LGA population median age in years	1986	1991	1996	2001
Boorowa	33	35	37	40
All rural NSW	31	33	35	35

Source: Australian Bureau Statistics 2001

The median age of the Boorowa LGA population increased by 21% during the period of 1986-2001, with an average age of 40 years in 2001.

While there is some evidence to suggest the name of Boorowa comes from the neighbouring Ngunawal people, it is widely accepted that the Boorowa area is part of the traditional country of the Wiradjuri people (Lloyd, 1990). The population of Indigenous people in the Boorowa LGA has increased significantly in percentage – by 600% during 1986-2001, yet the actual number remains small (n = 28 in 2001), representing just 1.2% of the total population [refer to Table 4, below]. Despite the increase in the Indigenous population, it was recently reported that most landholders surveyed in the Lachlan catchment (including the Boorowa area) felt that their lack of awareness of Aboriginal cultural heritage was not an important issue for them (Byron *et al.*, 2006).

Table 4 LGA indigenous population, 1986-2001

LGA indigenous population	1986	1991	1996	2001
Boorowa	4	8	35	28
All rural NSW (median)	106	138	190	266

Source: Australian Bureau Statistics 2001

Males comprised 51% of the population in the Boorowa LGA in 2001. The balance between males and females has remained stable since 1986 (ABS, 2001).

EMPLOYMENT DYNAMICS

Nationally, just 4.9% of employment is within the ‘agricultural, fishing, forestry and mining’ sector, yet the importance increases to 12% for areas outside metropolitan Australia (ABS, 2001). In 2001, nearly 50% of the employed population in the Boorowa LGA was employed in the ‘agricultural, fishing and forestry’ sector and although there were fluctuations, the proportion had declined slightly since 1986 when just over 53% of employment was within this sector. Given the low level of fishing and forestry activity in the Boorowa LGA, it is

reasonable to assume that most of the employment reported in the ‘agricultural, fishing and forestry’ sector is directly associated with agriculture.

Agriculture is a far more important source of employment in the Boorowa LGA than compared to all LGA in rural NSW, where about 23% of all employment in rural NSW is within the ‘agricultural, fishing and forestry’ sector (ABS 2001) [refer to Table 5].

Of the people employed in this sector in the Boorowa LGA, women comprise just over 25%. Also, the importance of agriculture to men’s employment is greater than for women’s employment, with agriculture representing 59% of the employment for men and 34% of the employment for women.

Table 5 Employment in Boorowa & rural NSW LGA

Employment, 1986-1996	Boorowa LGA			Rural NSW LGA median		
Total male	644	621	574	1518	1571	1580
Total female	325	361	346	848	1035	1057
Total persons	969	982	920	2349	2602	2542
Agric, fish & fsty – male	399	380	336	489	465	415
Agric, fish & fsty – female	118	117	118	206	174	163
Agric, fish & fsty – all persons	517	497	454	711	635	588

Source: Australian Bureau Statistics 2001

Agriculture remains an important sector for employment in the Boorowa LGA, representing 59% of employment for men and 34% of employment for women in 2001.

Interestingly, despite the decline in population in the Boorowa LGA, the number of wage and salary earners (ie. employees) has increased in recent years from 731 to 777 during the period of 1999-2002. The difference in these figures supports the view that more people have obtained paid employment (eg. farmers obtaining off-farm employment) during this period, while the majority of people leaving the Boorowa LGA may have been young families (including non-wage earners), school leavers (non-wage earners) and/or those self-employed (eg. retiring farmers).

People leaving the Boorowa LGA appear to be mainly families with school-aged children, school leavers and/or self-employed people, as despite a decline in overall population there was an increase in the number of wage and salary earners during the period 1999-2002.

WAGES AND SALARIES

The increase in the number of wage and salary earners is matched by a consistent increase in the total wage and salary income for this population from \$18.1 million (average \$24,787) to \$21.9 million (average \$28,222) during the period of 1999-2002 (ABS, 2003).

However, the proportion of total personal income comprised of wages and salaries has declined from 59.8% (in 1999) to 47.6% (in 2001), with the most notable increase in the proportion earned via self-employment from 4.1% (in 1999) to 19.1% (in 2001) (ABS, 2003). Also, the total personal income from all sources has increased considerably, from \$31.4 to \$44 million (during the period of 1999-2001). The proportion of people receiving government income support payments (eg. age pension, disability support pension) decreased from 17.9% to 14% (during the period of 1999-2001) as did the number of people receiving income support from government (611 people in 2003).

Recent figures indicate that in 2003, the registered unemployment rate in the Boorowa LGA was just 3.7% (n = 48), which is below the current national registered unemployment rate of 5.1% (ABS, 2005).

The ABS has developed an Index of Relative Socio-Economic Disadvantage (ABS 2001) – an index calculated using variable such low incomes, low educational attainment, high unemployment and people employed in low skilled occupations – all factors likely to reflect a community's inability to cope with changing circumstance. According to the ABS index, the population in the Boorowa LGA is less disadvantaged than the average non-metropolitan area across Australia.

HOUSEHOLDS, FAMILIES AND SERVICES

Domestic Households

Although there are fluctuations in the data, the total number of 'one family households' decreased by just over 10% during the period of 1986-2001. There was an increase of 68% in the number of 'one parent families' and an increase of 69% in 'lone person households' in the Boorowa LGA [refer to Table 6]. Across all LGA in rural NSW, the total number of 'one family households' increased by 7% during the period of 1986-2001, yet reflected the situation in Boorowa LGA with an increase of 44% in 'one parent families' and an increase of 55% in 'lone person households' (ABS 2001). An increase in 'lone person households' in the Boorowa LGA is consistent with an ageing population.

Table 6 Household composition in Boorowa LGA, 1986-2001

Households in Boorowa LGA	1986	1991	1996	2001
One Family Household: Couple Family With Children	1354	1371	1182	1191
One Family Household: Couple Family Without Children	588	443	504	526
One Family Household: One Parent Family	99	213	185	168
One Family Household: Other Family (eg. extended family)	99	26	15	23
One Family Household: Total	2140	2053	1886	1908
Multi-family Household	96	30	55	14
Lone Person Household	182	249	265	263
Group Household	38	28	28	21

Source: Australian Bureau Statistics 2001

There was an increase of 68% in the number of 'one parent families' and an increase of 69% in 'lone person households' in the Boorowa LGA during the period 1986-2001.

By national standards, rental costs and house and land prices in the Boorowa area are affordable, with about 72% of all occupied private dwellings either fully owned or being purchased in 2001 – higher than the national figure of 66%. Interviewees reported that house prices had increased markedly, but from a low base, as illustrated by the comment “... *until a few years ago you could get a nice house for \$50,000; now it is more like \$100,000 ... making it harder for young people to get a start here*”.

EDUCATION AND HEALTH SERVICES

The town of Boorowa has several child-care facilities, a pre-school, two primary schools (one private, one public) and a local high school. However, with the decline in the number of young families and youth, several interviewees doubted the viability of educational services in Boorowa. For example, a local school teacher reported that the Boorowa high school had 240 pupils about 20 years ago, but now the number fluctuates between 120-140 students and is expected to decline further with fewer enrolments than previously.

Boorowa also has a medical centre, local hospital and a Community Health Centre, which provides a range of services to residents of the district. Boorowa is the location of the main office for the Boorowa Shire Council.

IMPORTANCE OF AGRICULTURE

There are a number of agricultural industries in the Boorowa district, including merino sheep for fine wool production, specialised horse breeding and training farms, and cattle studs. The temperate climate, rich soils and reliable rainfall also make the region suitable for grains, such as wheat and canola (BSC 2005). Several interviewees mentioned that Boorowa's economy was still primarily reliant on the viability of the local farms.

In 2001, the total value of agricultural production in the Boorowa LGA was \$39.4 million, with wool comprising just over 50% of this value (\$20 million), meat and other livestock disposals about 28% (\$11.1 million) and crops about 21% (\$8.8 million) from 200-400 commercial farming properties (ABS, 2003). Given the importance of wool production to Boorowa's overall agricultural value, the profitability of wool enterprises will have a strong influence on farm incomes.

Wool production has been the main agricultural enterprise in the Boorowa area since the late-1800's, with farming properties typically cleared of most of the native woody vegetation to increase livestock carrying capacity. The average carrying capacity for the district was estimated at less than 6 DSE¹ per hectare in the late-1990's, with the most viable 20% of businesses having a gross margin of \$126/ha (Newman and Chapman, 2001). In 1996, just 20-30% of farm families had a disposable income above \$20,000 – the benchmark identified by the Farm Managers 500 group as the minimum threshold for financial sustainability (Barr *et al.*, 2000). While all interviewees acknowledged the difficulties farmers are currently facing, many saw this as a relatively temporary hardship with better times ahead. One interviewee mentioned “... *diversity is a key strategy. Those who diversify will survive in the long-term ... people need to act opportunistically and find niche markets*”.

In their recent survey of landholders in the 'Lachlan slopes' (a sub-region of the Lachlan catchment that includes the Boorowa LGA), Byron *et al.*, (2006: 45) found that over the period of 1986-2001, there was an increase in the number of rural properties (mainly due to sub-division of large properties), fewer landholders identifying themselves as farmers, and a

¹ DSE equates to Dry Sheep Equivalent, defined as the carrying capacity of an area to maintain the constant weight of a 50-kilogram wether sheep.

decrease in the size of rural properties – it is estimated that the current median property size in the ‘Lachlan slopes’ area is 114 hectares. Byron *et al.* (2006: 45) also found that only 46% of landholders in the ‘Lachlan slopes’ were farmers, with 23% being professional people, 6% employed in trades, and a further 12% of landholders were primarily employed in clerical, administration, retail or home duties. In addition, 13% of the survey respondents indicated they were retired, yet owned properties with a median size of 350 hectares (Byron *et al.*, 2006: 31).

The exit rate from commercial farming in the Boorowa LGA was estimated to be 5-6% per annum during the period of 1986-1996 (Barr *et al.*, 2000), considerably higher than the national rate of 1-2%, with 133,000 farming businesses recorded across Australia in 2003 (ABS, 2003).

Recent research indicates that in the ‘Lachlan slopes’ (a sub-region of the Lachlan catchment that includes the Boorowa LGA), there has been an increase in the number of rural properties, a decrease in the size of rural properties, fewer landholders identifying themselves as farmers, and a high exit rate from farming – indicating that ownership of rural land is uncoupling from agriculture.

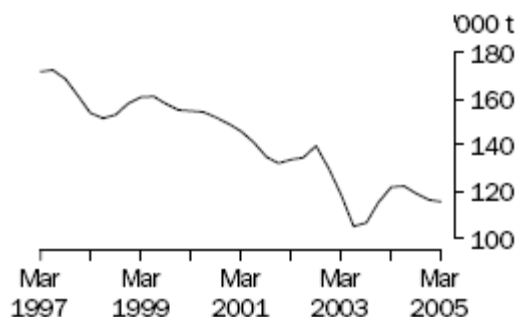
Nationally, the average land price in the ‘wheat/sheep’ zone has remained steady over the last 25 years, with prices staying within the range of \$100-200 per hectare (adjusted to 2003-04 dollars) (ABARE, 2005). Rural land in the south-east of the Boorowa LGA (within 1.5 hours drive of Canberra) has increased in range to \$2,500-5,000 per hectare (\$1-2,000 per acre) in recent years, well beyond the agronomic value of rural land in the district, which is estimated to be in the range of \$750-1,000 per hectare (\$300-400 per acre). It appears that non-farmers are willing to pay 3 to 5 times the agronomic value of land south-east of Boorowa. The divergence in rural land value and the profitability of the major rural enterprise – wool production, which occupies the majority of rural land – further indicates the uncoupling of land value from its perceived agronomic value. That is, the value of rural land in parts of the Boorowa district is increasingly influenced by non-agricultural interests, as indicated by an increase in rural properties, reduction in median property size, and a reduction in proportion of landholders who are farmers.

Sheep and wool

Across Australia, sheep and lamb numbers fell by 7% to 99.3 million, in the year ending June 2003 – the smallest estimated flock for Australia since 1947 (95.5 million). A major fall in sheep and lamb numbers was reported in NSW for the same period, which fell by 12% to 33.7 million (representing a reduction of 4.8 million sheep and lambs).

Following the recent decline in sheep numbers, the trade volume in wool has also declined – with 116,000 tonnes offered for sale in the March quarter of 2005 (ABS, 2005) [refer to Figure 3]. Compounding the challenges for wool production – half the current agricultural production in the Boorowa LGA – is that recent forecasts are for the price of wool to remain subdued for the next five years (ABARE, 2005).

Figure 3 Quarterly wool trade in Australia, 1997-2005 (ABS 2005)



SALINITY IN THE BOOROWA CATCHMENT

An objective of this Boorowa catchment profile is to inform NSW DPI of the socio-economic context in which current land-use occurs and to assist in the development of effective salinity mitigation strategies. The Murray-Darling Basin Commission (MDBC) reports that salinity is an increasingly serious problem throughout the Murray-Darling Basin, with salinity levels in the Murray River rising at a rate of 1.5 to 5.0 EC² units per year. The MDBC stated that the "... implications of the current salinity situation for the Murray-Darling Basin are extremely serious ... (people) have yet to get to grips with the underlying causes" (MDBC, 2005). Recent estimates indicate that there are 174,000 hectares affected by salinity in NSW, with a further 5 million hectares at risk (MDBC, 2005). In the Boorowa district, it is estimated that salt yields are occurring at 4-6 tonnes/km²/annum, with the Lachlan River (a boundary of the Boorowa LGA) increasing in salt concentration. Sharing the concern of the MDBC is the Lachlan CMA, whose region includes the Boorowa district in the south-east and has identified salinity mitigation as an issue on which to focus. As mentioned previously, the Boorowa catchment is within the Lachlan-Murrumbidgee region, a region where salinity has been identified as of concern in the NAP [refer to NAP, p.2].

However, the level of concern about increasing salinity as expressed by NRM agencies (eg. MDBC, Lachlan CMA) does not appear to be shared by rural landholders (Watson *et al.*, 2003). Byron *et al.*, (2006, p.iv) recently concluded that "Despite being identified as priority issues in the Lachlan Catchment Blueprint dryland salinity, removal of native vegetation, (and) water quality... were not rated as important issues by most landholders". Landholders appeared more concerned about the decline of services and employment opportunities (Byron *et al.*, 2006). While all interviewees acknowledged the presence of dryland salinity in the Boorowa area, few felt it was a critical issue and some believed it was being over-emphasised by agencies. One interviewee commented "... the feeling around here is that most landholders won't go broke because of salinity". Another mentioned "... most landholders have undertaken works such as tree planting to deal with it (salinity). People have a good understanding of salinity ... salinity is a minor worry, bigger concerns are the drought and fluctuating commodity prices".

Furthermore, there is doubt about the viability of current options to address salinity, as "... viable treatments for salinity prevention are only available for a small proportion of the agricultural land where they are needed" (Pannell, 2000, p.3). Also, others have concluded that "... changes on agricultural land are very unlikely to occur on the scale required to prevent the spread of salinity" (Bathgate, 2001, p.20).

² EC equates to Electrical Conductivity, the unit for measuring the salt concentration in water.

The concern expressed by NRM agencies that increasing salinity is a critical threat to landscape health does not appear to be shared by landholders and others in the local community.

The dichotomy between the goals of NRM agencies and the aspirations of landholders and others in the local community presents an acute challenge for integrated NRM. NRM issues viewed as critically important by government agencies are not necessarily shared by landholders, thereby challenging the capacity of NRM agencies to foment active community-government partnerships to improve NRM (Vanclay & Lawrence, 1995; Cary *et al.*, 2002). NRM issues may need to be explicitly linked in terms of impacts on aspects of importance to landholders in the Boorowa catchment, such as NRM issues being framed in terms of affecting employment opportunities (eg. salinity causing a decline in farm productivity) and their quality of life (reduced water quality, decline in native vegetation, less of the landscape supporting broadacre livestock enterprises) (Curtis *et al.*, 2000). To date, NRM projects appear to have had limited success in terms of changing the physical landscape around Boorowa, as reflected by the comment of Freudenberger *et al.* (2003, p.2):

The Saltshaker Project is an important milestone in a long journey of landscape evolution. The Project has significantly contributed to nudging the Boorowa catchment along a new pathway of sustainability. The Boorowa landscape has been on a long degradation pathway that has resisted efforts to improve its ecosystems. It will take multiple nudges to head the Catchment down an alternative pathway of healthy soils, freshwater, productive farms, diverse wildlife and vibrant human communities.

CATALYSTS OF CHANGE IN BOOROWA

Declining terms of trade in agriculture

There continues to be a pronounced decline in the 'terms of trade' (relative prices) in agriculture for farmers, particularly those involved in wool production (Fisher, 2005). Since the early-1970's, the terms of trade for wool production has generally declined. As wool production has had a major influence over the development of, and land-use within, the Boorowa district, the decline in viability of wool production has had a major impact on families' prosperity and rural land-use (Gray and Lawrence, 2001). A subsequent impact of this is there appears to be less succession of farming properties within families, and the average age of farmers is increasing. One interviewee explained he "... would like (his) children to stay and continue the family tradition of farming, but it needs to be easier ... they need to be able to earn an income".

Severe drought

The drought that has affected inland NSW for most of the past two years (2005-06) has had a marked impact on the level of agricultural production. The current drought has been described in the media as the "... worst drought in a hundred years" (The Australian, October 2004), and has intensified media and political debate about water reform. Prolonged periods of below-average rainfall in the Boorowa district has forced farmers to reduce stock numbers and the scale of cropping which, in turn, impacts on production levels and farm incomes. Prolonged periods of below-average rainfall (drought) also occurred during 1994 and 1982 – affecting many of the current farmers. One interviewee mentioned "... we have had good times and bad times; now is an extra bad time".

All interviewees mentioned the current drought as having a major impact on the Boorowa economy, with the impact compounded by poor prices for wool and the ageing population. One interviewee explained that "... people don't spend in a drought and this affects all of the

local businesses”, with a marked decline in rural incomes. Although some others mentioned that there was a minimal impact on their businesses.

Land prices unrelated to farm incomes

The value of rural land in the south-east of the Boorowa district has risen 3 to 5 times its perceived agronomic value – with land purchased by people who want small rural properties (4-80 ha) and don’t identify themselves as farmers. The presence of Canberra, a major population and employment centre only 1.5 hours drive from Boorowa, is believed to be placing upward pressure on the value of small rural properties. Although newcomers to the Boorowa district may not be dependent on agriculture for their livelihoods and nor identify themselves as farmers, it appears they value highly the ‘agricultural’ landscape and cohesive rural community. For such people, their livelihoods are not dependent on agriculture, but their ‘quality of life’ is. One interviewee said “... the quality of life is good here ... this is paradise. Boorowa has been a tight-knit community where it can take you an hour to walk down the main street ... (but) now I can walk down the main street and see faces I’ve never seen before”. Some even mentioned there had been a mini-real estate ‘boom’ in recent years, with a number of residential housing estates constructed and sold.

Tourism is also believed to be contributing to Boorowa’s economy, albeit in a small way. One interviewee reported that the annual wool festival attracts about 10,000 people to the town, and there is a “... steady stream of people travelling through on the Lachlan Valley Way”.

New landholders moving into the Boorowa district appear to have less dependence on agriculture, yet are willing to pay high land prices for the district’s ‘agricultural’ landscape and sense of community.

At a superficial level, the ‘agriculture’ landscape (ie. the appearance of viable agricultural enterprises) can mask the profound socio-economic and demographic change occurring within the Boorowa district. The social values that underpin traditional commercial farming appear to be becoming less prevalent, with the consequence that the threat of lost farm production due to salinity is unlikely to be of serious concern to new landholders. This shift in values may also offer opportunities for salinity mitigation, as non-farming landholders may be less likely to face the economic pressure to carry high livestock numbers and so could afford greater pasture cover or perennial vegetation (eg. non-commercial trees and shrubs). Incentives to change landholders’ behaviour are more effective when these match the values held by landholders (Cary *et al.*, 2002). Therefore, improved agronomic technologies and farm-based incentives are unlikely to be an effective stimulus for behavioural change in the increasing number of landholders in the Boorowa catchment who do not identify themselves as farmers.

However, there needs to be caution when interpreting peoples’ attitudes and values as a means of understanding their behaviour, as a complex range of factors can constrain a shift in behaviour (Vanclay and Lawrence, 1995; Cary *et al.*, 2002). For example, a positive land stewardship ethic may not be evident if a landholder is constrained by the high cost of changing farm management. In the case of the Boorowa district, the declining profitability of wool production in combination with the recent exceptionally dry climate are likely to have constrained changes towards recommended NRM. The key socio-economic changes that have occurred in the Boorowa district over recent years are summarised in Box 1.

Box 1 Key changes in the Boorowa district

Key changes in the Boorowa district

The socio-economic profile of the Boorowa district discussed in this report indicates the key changes include:

- population is decreasing and ageing – with those leaving mainly young families, youth post-secondary school and self-employed people;
- community and Boorowa's economy is still highly reliant directly on agriculture, with the prosperity of farming affecting a number of businesses in the short-term (eg. farm supplies) and long-term (eg. schools dependent on children from farming families);
- increase in the number of rural properties, decrease in the size of some rural properties, fewer landholders identifying themselves as farmers (mainly south-east of Boorowa), and a high exit rate from farming – suggesting that ownership of rural land is uncoupling from agriculture;
- Boorowa catchment still reflects an 'agricultural' landscape, with the majority of rural land still occupied by commercial farms and recently arrived non-farming landholders continuing to value the district's farming landscape;
- concern expressed by NRM agencies that increasing salinity is a critical threat to landscape health does not appear to be widely shared by landholders and others in the local community;
- socio-economic and demographic changes occurring are typical of inland NSW, with the change in some aspects more pronounced due to Boorowa's reliance on wool production and proximity to a major city (ie. Canberra) – bringing challenges and opportunities; and
- key factors driving this change appear to be: the prolonged decline in the terms of trade for farming; extended period of below-average rainfall (drought); and the arrival of non-farming landholders.

SECTION 2: SOCIO-ECONOMIC PROFILE OF LANDHOLDERS IN THE BOOROWA CATCHMENT

BOOROWA LANDHOLDER PROFILE

This section of the report will provide more detailed discussion on some topics identified earlier for a profile of rural landholders in the Boorowa district, located in the central highlands of New South Wales. This profile has been developed as a means of exploring the social, demographic and economic context of the management of farmland, particularly in terms of reducing the risk of dryland salinity. This section aims to increase people's awareness and understanding of the socio-economic dimension of rural landholders, particularly those in the Boorowa district.

Specific research questions used to frame this section include:

- what are the socio-economic characteristics of landholders?
- what socio-economic changes/trends are apparent amongst landholders?
- what future do landholders aspire and anticipate?
- what are the implications for salinity management in the Boorowa area?
- is there a spatial pattern to land-use that relates to the socio-economic characteristics of Boorowa's landholders?

Research approach

A combination of research methods and data sources was used to generate the information presented in this section of the report. This mixed-method approach is commonly recommended for social research, with the combination of methods and cross-referencing of data likely to generate results that are reliable and valid (Giddens, 2001). The information discussed below was based on data from:

- semi-structured interviews with a selective or purposive sample of landholders and land management/agronomic advisors (list of interviewees included as Appendix 1);
- workshops with a range of landholders to explore their 'preferred futures';
- data collected by the ABS (eg. national census of Population and Housing, 2001) and Australian Bureau for Agriculture and Resource Economics (ABARE) (eg. Farm Survey);
- results from a recent mailed survey of landholders in the Lachlan catchment, NSW (Byron *et al.*, 2006); and
- published peer-reviewed research.

Given there was little existing data specific to landholders in the Boorowa district, and many of their socio-economic characteristics reflect trends apparent for rural NSW and other parts of rural Australia, this report draws on data collected at a broader scale, such as that collected for the 'Lachlan slopes' (Byron *et al.*, 2006) and rural NSW (ABS Census), cross-referenced with information generated in the interviews and workshops with landholders. The two half-day workshops held with landholders sought to explore the past, present and future dimensions of the management of farmland in the Boorowa district. The workshops were organised with the assistance of the Lachlan CMA (Appendix 2: Lachlan CMA's letter of invitation to landholders), and were conducted over half a day in July 2006 (Appendix 3: Workshop format).

SOCIAL AND DEMOGRAPHIC CHARACTERISTICS

The median age of the population in the Boorowa LGA in June 2003 was 43 years, an increasing trend from a median age of 35 years in 1991, and 40 years in 2001 (ABS, 2001). The median age in the Boorowa LGA is higher than the median age of 36.4 years for the NSW population (ABS, 2004). The median age of landholders in the Lachlan catchment is estimated

to be much higher, with a median age of 51 years recorded in a survey of landholders (Byron *et al.*, 2006) – the same median age recorded in 2001 of farmers across Australia (ABS, 2003).

The median age of landholders in the Lachlan catchment is estimated to be 51 years, a similar median age for all Australian farmers recorded in 2001.

In 2001, one-third (52,500) of Australia's farmers were women (ABS, 2003). While the number of women farmers decreased by about 30% during 1986 and 2001, the ratio of male-female farmers remained relatively stable (ABS, 2003).

Also, the level of formal education attained by landholders in the Boorowa district appears consistent with that of rural NSW, yet lower when compared to the national population. It is common for rural communities to have lower levels of formal education than urban counterparts, given the more limited access to formal education institutions and lower demand for professionally qualified people in rural areas than in capital cities. The median age of rural communities also tends to be higher than urban centres as young people move to urban centres to pursue further training opportunities.

Identity of farmers and source of household income

Of all rural landholders in the 'Lachlan slopes' area (including the Boorowa LGA), only 46% identify themselves as 'farmers' (ie. their primary occupation), working a median of 60 hours per week (Byron *et al.*, 2006, p.44). Also, only 50% of landholders reported a profit from their farm business, yet 76% reported a profit from off-farm sources (Byron *et al.*, 2006).

A majority of landholders in the 'Lachlan slopes' area (54%) do not identify themselves as 'farmers', instead reporting that they are employed primarily as professionals (23%), retired (13%), or engaged in other activities (Byron *et al.*, 2006, p.45).

It is important to note that 'farmers' and 'farm families' may earn more money from off-farm than on-farm sources, and be engaged in employment away from their property for a considerable time each week. This is likely to be an important point in terms of how and when agencies communicate with farmers and other landholders, and expectations of the capacity of landholders to implement new land management practices (Pannell *et al.*, 2006). Interviews with Boorowa landholders off-farm income was important to the family's household budget, with off-farm sources of income now becoming an established component of household incomes for rural property owners, rather than just a temporary income source for some (eg. only in times of financial crisis).

Boorowa landholders reported off-farm income was important to a family's household budget, and for many landholders off-farm income had becoming an established component of their household income and was not simply a temporary income source.

Rural incomes in NSW were recorded to be considerably lower than metropolitan incomes, with the median annual wage and salary income for non-metropolitan NSW during 2000-'01 was recorded at \$30,407 compared to all of NSW at \$37,191. However, at a national level a more recent report noted a '... recovery in the rural zones' real incomes ... resulting in an improvement in demographic outcomes', such as a slowing in the outflow of young people and an increase in people of working age (National Economics, 2003, p.4).

Boorowa properties

There is growing evidence that ‘farmers’ and non-farmers manage private rural land differently, having important implications for primary production, natural resource management, capital value of rural property, and the nature of information and other support required by landholders to meet their lifestyle and land-use aspirations.

Interviews with Boorowa landholders indicated most landholders, whether large or small, had a diverse enterprise mix. Of those interviewed, most commercial farmers and part-time/lifestyle landholders interviewed reported that having a diverse mix of enterprises (diverse income sources) has been vital to surviving on the land, particularly over recent years with low terms of trade for some commodities (notably wool) and below average rainfall. However, some previous research challenges the conventional view that farm diversification always helps farm families survive harsh times (Campbell White and Black, 2002). For example, some research indicates that the complexity of business and information management increases with diversification, and so it can make it more difficult to achieve optimum performance across a number of unrelated enterprises.

In the recent survey of landholders in the ‘Lachlan slopes’ area (Byron *et al.*, 2006), including the Boorowa LGA, the median size of rural properties was 114 hectares. By combining property size with the typical agronomic potential of the district (DSE = 5.6 per hectare, NSW Department of Lands, 2007) and the gross margin for a fine wool enterprise (\$10.4 per DSE, NSW Department of Primary Industries, 2005), the business would generate a farm profit of just \$6,640 – well below the median gross household income of \$45,292 recorded for all Australian households in 2002-03 (ABS, 2004). Clearly, families with an average-sized grazing property in the Boorowa district could not sustain their livelihoods primarily from wool production, making it highly likely they have considerable off-farm income. Also, given the low returns for wool production on an average-sized property and the need for off-farm income, it is not surprising that the majority of landholders in the ‘Lachlan slopes’ area do not identify themselves as full-time farmers, and the reported importance of off-farm income to the household budget. Other research has found that there is a positive correlation between property size, farm income and adoption of current recommended practices (Curtis *et al.*, 2002). Given the low level of income from averaged-sized grazing property in the Boorowa district, this would suggest many landholders are unable to invest in recommended practices for improving the management of farmland.

The low level of income from farm enterprises on an averaged-sized grazing property in the Boorowa district indicates that many landholders are unable to invest in the recommended practices for improving the management of farmland.

Even when using the figures for the typical grazing property in the Boorowa district – calculated as 302 hectares and carrying 1,700 fine wool sheep (wethers) (NSW Department of Lands, 2007), the farm business profit is still only \$17,680 p.a. In what appears to be inconsistent with the low profitability for the typical grazing property in the Boorowa district, property prices (land value only) have increased dramatically since the year 2000. The timing and rate of increase in land value of rural properties in the Boorowa district is estimated to be similar for sub-commercial ‘hobby’ farms around the nearby regional centre of Yass [NSW Department of Lands, 2007]. Given there has not been any comparable increase in the value of wool, and none anticipated in the next 5 years (ABARE, 2005), it appears the value of rural land in the Boorowa district is not being driven by wool-based enterprises – a major land-use [Table 7].

Table 7 Typical property size, productivity and land value in Boorowa LGA, NSW

Locality	Farm area (Ha)	Carrying capacity	1996 land value	2006 land value	Farm enterprise profit
Boorowa	302	1,700	\$240,000	\$546,000	\$17,680

Source: NSW DPI (2005) and NSW Lands (2007).

Although 22% of respondents in the ‘Lachlan slopes’ reported plants on their property showing signs of salinity, Byron *et al.*, (2006) found no statistical correlation between signs of salinity and landholders undertaking recommended best management practices. What would appear to be valuable for salinity management is the linking of social and biophysical data (Curtis *et al.*, 2003 and 2005). However, to date it has not been possible to prepare overlays of the characteristics of property ownership with data on soils considered ‘at risk’ of salinity (work is continuing on this by NSW DPI).

Information from interviews indicates that non-farming landholders in the Boorowa district are more likely than commercial farmers, to have properties comprised of:

- small areas of farmland (<100 ha) less suitable for grazing and/or cropping enterprises,
- farm enterprises contributing a small portion to household income, and
- land with a capital value reflective of its aesthetic quality (eg. views, native remnant vegetation) and proximity to urban centres.

Property management

A range of social and economic factors determine the management of rural properties, such as:

- time available for on-farm activities,
- finance available to invest on-farm,
- knowledge and skills for farm and enterprise management,
- desired and perceived ability to make a ‘living’ from the farm,
- aspirations of landholders, and
- development/ management plan for the property.

Commercial farmers usually aim to optimise the production of agricultural enterprises, while investing in activities to secure the environmental qualities of their properties. Non-commercial lifestyle landholders tend to manage their properties to reflect their lifestyle choices, have a preference for low-input/management systems, and may be more likely to explore unconventional enterprises. Research indicates that commercial farmers and lifestyle landholders both have a high degree of ‘land stewardship’ (sense of being a custodian) and, given the financial capacity, are equally willing to adopt forms of ‘Landcare’ farming (Cullen *et al.*, 2003).

There is evidence that having a written property management plan (eg. whole farm plan) correlates to landholders undertaking environmental works. However, some landholders interviewed, mainly part-time/lifestyle landholders, reported a concern that much of the ‘farm management advice’ provided by agencies was tailored to commercial farmers. As such, they doubted how reliable this advice would be for non-commercial farmers, such as whether ‘best management practices’ for commercial farmers is just the same as for ‘lifestyle’ landholders – who may be seeking to develop sustainable low-input farming systems.

Using a range of possible ‘best management practices’ for the central-west region of NSW (Little River catchment), Kelly and Buckland (2005) undertook detailed economic analysis of different land-use options that could be expected to reduce dryland salinity (NSW Agriculture and DIPNR, 2004). The analysis was constructed using a typical farm for the region – 1,000 ha with 70% under pasture. The application of lime to reduce soil acidity (‘liming’ option)

was assessed as likely to provide the greatest benefits, with yield increases in crops, increased pasture and livestock production. By contrast, the establishment of a 40 ha softwood plantation ('forestry' option) is likely to reduce the farm business profit, with slow growth rates and an uneconomic distance to the nearest mill. The returns from conventional farm forestry were assessed to be significantly below the returns from typical cropping or livestock, which forestry would replace. Other land-use options were assessed between the 'liming' (best option) and 'forestry' (worst option) option [refer to Table 8].

The returns from conventional farm forestry were assessed to be significantly below the returns from typical cropping or livestock enterprises in the central-west region of NSW.

Table 8 Ranking of salinity management options from a farmer's perspective

Best Management Practise	Effect on farm profit	Expected water use	Level of Management skill required	Chances of success	Overall rating
Reduce fallow length	small -ve	small	low	medium	**
Opportunity cropping	med +ve	small	high	low	**
Pasture phase length	small -ve	medium	low	high	***
Perennial mixed pastures	small -ve	large	low	medium	***
Forestry	large -ve	large	high	low	*
Liming	large +ve	small	low	high	****
Salt land agronomy	small +ve	small	medium	medium	***
Percentage (factor's influence in overall rating)	50%	10%	15%	25%	100%

Source: Kelly and Buckland (2005)

As well as having significantly different on-farms impacts, land management options can have downstream benefits or costs, with considerable variation depending on the type of land-use, desired water yield and salt-load targets (Nordblom *et al.*, 2006). Nordblom *et al.* (2006, p.400) concluded "Significant reductions in stream salinity will require strategic land-use change on a scale that will only occur if the changes are profitable to farmers". While not suggesting landholders necessarily pursue these options, Kelly and Buckland's (2005) analysis illustrates the economic variation between agronomic options for managing dryland salinity. While commercial farmers in the Boorowa district could be expected to be interested in the 'liming' option for improved yields, few farmers would have the available funds to pursue this option on an appreciable scale. Also, non-commercial farmers, or 'lifestyle' landholders, may have higher levels of household income than many farmers, they could expected to be uninterested in pursuing the 'liming' options if they perceive it has little value to their lifestyle.

While commercial farmers in the Boorowa district could be expected to be interested in applying lime to improve the growth of perennial pastures, few farmers would have the available funds in the current context to pursue this option on an appreciable scale.

THE FUTURE FOR BOOROWA LANDHOLDERS

Factors that influence perceptions of the future, for individual landholders and the Boorowa district (general/big picture), include: extent property is meeting lifestyle aspirations, vitality and sense of community, feeling of being connected, valued and supported by community (see discussion on social sustainability, below).

Interviews with landholders in the Boorowa district indicated that many have a degree of uncertainty about pursuing their current lifestyle or property management beyond the next 12 months. They reported that their futures (5-10 years ahead) are largely determined by external forces (eg. commodity prices, weather, children's' long-term plans), with their current lifestyle and property management governed by meeting a mix of short-term challenges (eg. paying bills, getting the crop in). As such, most landholders interviewed were very uncertain about how their property would be managed in 5-10 years time.

Boorowa landholders reported that their futures are largely determined by external forces, with their current lifestyle and property management governed by meeting a mix of short-term challenges. Most landholders interviewed were very uncertain about how their property would be managed in 5-10 years time.

Property turnover

Byron *et al.* (2006) found that in the 'Lachlan slopes', 34% of respondents were likely to sell their property and 35% were likely to expand their property in the next 10 years. Also, Byron *et al.* (2006) found no link between succession planning by farm families and their investment in current recommended practices. However, about 50% of landholders in the Lachlan catchment have indicated a high level of interest in receiving financial incentives to support on-farm revegetation activities (Byron *et al.*, 2006).

'PREFERRED FUTURES' OF BOOROWA LANDHOLDERS

Workshop approach

The purpose of the two workshops held on the 9th and 11th July in 2006 was to understand the views of a wide range of landholders in the Boorowa district in relation to the:

- qualities of their property they value, and challenges of their property;
- characteristics they appreciate and the limitations of the Boorowa district; and
- preferred long-term future for their properties and the Boorowa district.

Information from the workshops was used to further explore the socio-economic context of salinity control in the Boorowa district, including our assessment of the extent current policies and programs of NRM agencies match the aspirations of landholders in the Boorowa district.

The workshops were deliberately small in number (5-7 participants) in order to maximize the opportunity for group discussion. The workshop participants were broadly categorised into two groups – people not fully dependent on agriculture for their household income (workshop A), and people highly dependent on agriculture for their household income (workshop B). A staff member from the Lachlan CMA – Boorowa office, David Hilhorst (Catchment Management Officer) invited the participants to attend the workshop via a letter [see Appendix 2: CMA letter] and a subsequent phone call, about one month before the workshops. CSU researchers phoned all participants in the week prior to the workshops to confirm details about the workshop.

The workshops were held at a central location – the Ram and Stallion Hotel, Boorowa, in a separate room from 9.30 am to 3.00 pm. For convenience to landholders, the workshops were held during winter and on days when it was expected that farm-based activity would be lower – Sunday (workshop A) and Tuesday (workshop B). To minimise any influence on group discussions by NRM agencies, the workshops were facilitated by CSU researchers (ie. non-residents of Boorowa district and from an organisation unrelated to NRM) with no agency staff participating. The workshop program was structured to explore the views of landholders in relation to their properties and the Boorowa district – now and in the long-term (10-12 years) [see Appendix 3: Workshop program]. To assist discussion about the different impacts of change on rural towns and communities, the ‘Country Living 2005’ video (prepared by NSW DPI, approximately 25 minutes) was shown at lunchtime, followed by a discussion about the major challenges and opportunities highlighted in the video.

The facilitators recorded key points raised by participants – individually and in group discussion – on large sheets of flipchart clearly displayed on the walls. This information on the flipchart sheets is presented below, separately for each workshop. The information is a collection of all views expressed openly at the workshops, and so reflects the range of views rather than necessarily a consensus view.

Box 2 Profile of participants in Workshop A

<p>Box 2 Profile of participants in Workshop A</p> <ul style="list-style-type: none"> • Total of 5 people, with an age range: 31-40 years to >70 years. • All list their rural property as their primary place of residence, having lived there for an average of 6.7 years [range: 1-16 years]. • Average property size = 128 hectares [range: 18-300 ha]. • Main farm enterprise = cattle, revegetation/bush management, prime lambs, crops. • Off-farm income: 3 people derive 100% of their income from off-farm sources [range: 0-100%]. • No one reported a pre-tax net profit from their farm business in 2005-06. • Long-term plans: most reported their interest in maintaining their current farm size and management; with 2 people interested in intensifying their farm management (2 people have agreed succession plans).

Results – Workshop A (small-scale landholders/non-farmers)

What we value about the Boorowa district

- Strong sense of community ... you feel like you belong, there’s a strong sense of community spirit, you have time to smell the roses, after being away in the city, I have a feeling of ‘I’m home’. People in six cars on the main street waved g’day to me.’
- Opportunity to get involved in local groups and make a difference (business & environmental groups) and to easily participate in local sporting groups, such as bowls and golf, and the local fishing club – good community participation and mutual support, it’s easy to get involved in a range of activities
- Quiet area ... it’s peaceful here,
- Openness and ruggedness of the countryside, and the natural environment ... the topography is suited to good town planning,

- Good place to live and work ... it's affordable living here compared to Canberra and Sydney.

The limitations of the Boorowa district

- *'Lifestyle comes at a price'* Lack of access to public transport,
- No public transport (eg. taxi, bus) – no backup travel, compounded by high petrol prices,
- Limited educational opportunities (eg. no tertiary options), *'We're limited by numbers in schools'*.
- Few employment opportunities,
- Limited health care, old aged care and social services,
- Limited access to public institutions (eg. Medicare, ATO),
- Lack of financial institutions – for advice & services,
- Limited entertainment – for all ages, and long distances to activities & services in other towns (eg. Young, Canberra), *'Kids are bored out of their brains'* (can be a problem with drug use),
- For new residents, living here often means being further away from family & friends.

What we value about our properties

- Aesthetics – the views, trees around the boundary, near the river,
- Diversity of wildlife,
- Serenity & seclusion (neighbours not too close) – yet walking distance to town,
- Potential to improve/develop the property,
- Provides an income and is increasing in capital value,
- Increasing my knowledge about land/farm management,
- Having a bond with our property – the satisfaction that it's yours, and the tradition of family involvement over several generations.

The limitations of our properties

- It's an expensive financial outlay – to purchase & improvements,
- Too much regulation affecting how you manage the property (eg. water licences, stock identification, OHS, chemical certificates, etc.), and it's costly to comply with (eg. annual water licence needs to be paid regardless whether you receive/use the water), *'there doesn't seem to be an end to it', ... 'there's four different departments with respect to water'*,
- Complex management issues (eg. pest plants & animals, erosion, salinity) – with mixed/confusing information and advice from different sources (eg. science is not always complete or agreed by experts), *'they're still fighting about what's right and wrong'*,
- Uncertain how to maximise returns from our property – so many factors involved with complex trade-offs,
- Climate variability (most specifically, drought) affects land management – more acute impacts if it affects your source of income, such as farming.

Our goals for the Boorowa district in 10-12 years

- More employment – small and medium-sized businesses (eg. light and intensive agricultural industries),

- Strong sense of responsibility towards the environment – greater participation and practice of environmental activities (eg. increased tourism based on bird watching and involving landholders/farmers),
- More niche farming – need reliable and secure water supplies,
- More efficient water use – public and private,
- Improved streetscape (eg. increase the visibility of the river walk, improve the parks and gardens in town),
- Tertiary education institution – focused on specialist areas,
- Good transportation – all forms (eg. taxi, bus, train),
- Improved medical services.

Our goals for our properties in 10-12 years

Efficient water allocation and use – allowing more intensive farming so smaller properties become financially viable,

Generate sufficient income to support livelihood,

Improve farm management by further subdivision of paddocks,

Plant more trees and shrubs to increase bird life (eg. *around my large dam to create a sanctuary*), control erosion around the creek, and to control salinity and weeds.

General discussion

Workshop participants discussed the changing mix of, or balance, between commercial farms and lifestyle properties; ‘about people making a living off the land, and those who aren’t’. It was expected that this will increase as a trend, but the ‘right balance’ must be maintained. Participants reported that non-farming landholders (‘tree changers’) have been known to complain about farming practices such as spraying of paddocks, or operation of farm machinery, which interferes in their sense of a rural aesthetic or amenity. Animal rights issues also relate to this point, with ‘tree changers’ often behaving with a different ethic than experienced commercial farmers.

Also, some participants discussed they felt it can be difficult to fit in with CMA guidelines for grants (eg. landholders wanted to improve aesthetics of their property, or undertake specific education/training, but found it difficult to obtain financial support for these activities).

Box 3 Profile of participants in Workshop B

Box 3 Profile of participants in Workshop B

- Total of 7 people, with an age range: 31-40 years to >70 years.
- Their rural property is the primary place of residence for 5 people, having owned/managed the property for an average of 21 years (2 people were managing properties that had been in their family for several generations).
- Average property size = 778 hectares [range: 45-1,800 ha].
- Main enterprises = wool, prime lambs, cattle, horses.
- Wide range of dependence on off-farm income: 0-100%.
- Wool, then meat (cattle and prime lambs), was the most common source of farm income.
- Only 2 people reported a pre-tax net profit from their farm business in 2005-06 (both <\$40,000).
- Long-term plans: most reported their interest in maintaining their current farm size and management, with 2 people indicating they wish to intensify their farm management.
- Three people reported a desire to increase the area they farm, most likely via leasing land (3 people have agreed succession plans).

Results – Workshop B (commercial farmers)

What we value about the Boorowa district

- Strong sense of community ... people are friendly, you know people, people are supportive, a good mix of people, great community involvement (eg. Woolfest, Landcare),
- Good for raising a family (ie. safe for kids, good recreational facilities – swimming pool, oval),
- Good sized community – you can get involved and make a difference (eg. establishment of the community bank), there's a good mix of people from different backgrounds,
- Not too many people, not too busy – you have privacy to '... to do your own thing' (Sydney has too many people and not enough sheep!),
- Proximity to Canberra, Young and Cowra, so enables people to find an off-farm source of income, yet Boorowa is '... the start of the countryside',
- Good agricultural area – good soils and climate (usually!), suitable for livestock and cropping (in parts), you can't find much better. Drought is worse farther west. Can't think of anywhere else to set up a farm.
- Lack of people ... in Sydney there's too many people, and not enough sheep,
- Good characteristics – some bush/timber, cleared farmland, undulating with good views,
- Good investment – capital value of property has continued to increase,
- Access to farm supplies,
- Good access to medical services.

The limitations of the Boorowa district

- Too expensive to buy additional farmland, particularly if wanting to pay off purchase via farming,

- High fuel prices – has made it very expensive for commuting (eg. for off-farm work, recreation) and general farm operations,
- Poor services from local government (eg. Shire is insensitive to people under financial pressure, haven't managed people's expectations very well, poor roads for level of rates),
- Poor internet and mobile phone coverage – making it difficult to access information (internet) and conduct business (internet & mobile phone),
- Insurance & rates increasing significantly over recent years, regardless of low returns from farming.
- *Incomes in the country aren't that flash, but it's the lifestyle.*

What we value about our properties

- Aesthetics – views from house, undulating country, near the river,
- Lifestyle (peaceful, private, good neighbours) and location (close to town for work, shopping & services),
- Family history associated with property,
- Interesting Aboriginal and European history,
- Good bushfire brigade,
- Small business opportunities available (eg. diversification possible on farms),
- Productive agriculturally – with a good variety of land (soil type) & vegetation,
- Property is well setup for efficient farm management ... *I've created the environment I want* (eg. laned paddocks, windbreaks, shearing shed & yards),
- Drought-proof (eg. permanent creeks, bores, dams),
- High capital value of property,
- Healthy trees – diversity of native plants, birds and animals.

The limitations of our properties

- Limited carrying capacity (due to poor soils), so limits opportunities for other enterprises (eg. cattle), drought and providing continued feed for animals—'meals on wheels',
- Wool-based enterprise, so currently not generating sufficient income and have low financial reserves,
- Neighbours – some are absentee landholders and others work away from the property a lot, so no-one available for the bushfire brigade (a damaging bushfire occurred in the Boorowa district in January 2006),
- Limited knowledge (soils, managing weeds, business) about what my property can achieve, a perception that there are limited opportunities to diversity.
- Farming is more complex (business requirements & enterprise management), together with the last 4-5 difficult seasons ... *has made farming really tough for a lot of people, there's just not enough time to do everything that's required (I do my paperwork during the day to make sure it gets counted as a normal part of the business), but it's difficult farming by yourself,*
- With low incomes we don't necessarily have the money to employ anyone (eg. cost of accounting is high),
- It's very difficult to make an income, has been this way since 2002 – off-farm income is needed,
- The farm is too big to farm part-time, but too small to generate enough income ('catch 22' situation) ... *can't afford to buy or lease more land,*
- *My age ... I'm not as able or motivated as when I was younger.*

Our goals for the Boorowa district in 10-12 years

- Balanced development – not swamped by urban development, but with a clear zone for subdivision of rural (permit a house on less than 1-200 acres), this will also provide flow-on benefits to the town,
- Developing niche markets (might include superfine wool), but likely to require greater labour input,
- Prosperity on farms and in the town (a vibrant and competitive local economy) – greater income levels and security (otherwise we'll see the continued decline of family farms), the growth based on the district's agricultural potential (eg. more active use of the saleyards, this has an important social aspect as well, meeting up with locals) – need to maintain the viability of the family farm,
- Maintain the affordability for people to buy a house & live in the district,
- Better understanding of ourselves and country (eg. what is possible in business and with the environment) – a 'green' landscape (more trees, support to establish permanent pastures) and better use of water (eg. reduce salinity in river) to support light industry,
- Council in touch with people's lives and needs (keep Council area the same size),
- Establish an airport.

Our goals for our properties in 10-12 years

- Create a property that is aesthetic, healthier (eg. permanent pastures, increase biodiversity, reduce weeds) and productive (improved & protected soils) ... *I want to improve the farm at least a little bit each year, create a balance between biodiversity and production,*
- Improve my lifestyle (eg. go on a holiday, have more time, farm without the intense financial pressures & worries) ... *not to worry about whether I'm going to go belly up next week,* and be more self-sufficient (power, food),
- Improve the farm's infrastructure (better fencing and yards) and livestock (eg. increase fine wool & meat production),
- Have better water supplies,
- Be paid for the public good benefits generated on farms.

General discussion

- There can be a mindset that there is limited opportunity to diversify,
- We need financial support to establish permanent pastures (*a recent quote was \$850-900/ha, which I certainly can't afford*),
- *Things need to improve with wool in the next 1-2 years, or else we're going to have to sell,*
- There's not enough funding getting to farmers via the CMA – even in-kind support for projects can be expensive ... *forms don't have a cheque book attached to them, there can be a long delay before being reimbursed,*
- Applications for projects (support) are too 'top heavy' ... *bureaucratic and 'top down', they're not listening to farmers, they basically have their thumbs on our foreheads, they don't trust you, they think you're getting something for nothing, they need to learn how to work with farmers, not to tell them how to do it,*
- Landcare used to be strong (popular and active) when it was run by farmers, but now it seems a lot weaker now it is under the control of the CMA (*we don't know the people on the CMA Board*),
- A good approach is used by Greening Australia (ACT/NSW) with their Transgrid (financial sponsor) project: appeared to be less prescriptive and more flexible, funds provided upfront (*you're not waiting months for a rebate*), there is a high level of trust between the farmer and GA staff that the agreed work will get done, and people are

allowed to build up slowly (*start small but increase their environmental works as their confidence and capacity increases*).

LINKING SALINITY MITIGATION WITH LANDHOLDER ASPIRATIONS

The results from this research appear useful in understanding the current and future management of farmland in the Boorowa district, in terms of:

- a) property management,
- b) reliance on farming for household income,
- c) willingness to invest in NRM activities that may take some years to generate benefits, and
- d) the relationship and communication between landholders and agencies.

The broad goals of landholders in the Boorowa district discussed above – both commercial farmers and non-farmer landholders – are to continue to develop the landscape improvement and business capacity of the district, providing the positive social outcomes of retaining and increasing a diverse population. These are remarkably similar goals to the Lachlan CMA, which aims to have vibrant and sustainable communities and landscapes. However, there are obvious challenges when attempting to align the strategies employed by the CMA with the capacities of landholders. For example, an incentive approach that rebates landholders for some/all of the capital works associated with approved NRM works can hold little appeal for landholders who do not have sufficient financial reserves to absorb the initial costs upfront for some NRM works (eg. fencing off riparian vegetation, establishing perennial pastures).

Findings from this project are consistent with recent research in Western Australia (Measham, 2006), which found:

- landholders are constrained by multiple factors that affect their ability to manage salinity (knowledge and financial constraints, reaching agreement with agencies and other landholders);
- there is not broad agreement on what is ‘best practice’ to manage salinity; and
- a cooperative ‘trial and learning’ approach amongst researchers and landholders was effective.

Social impacts of declining farm production

Declining productivity of farmland, due to salinity or other causes, is likely to reduce the income from the farm business. Several social impacts may arise, including landholders experiencing:

- increased pressure to obtain income from off-farm sources;
- less time and motivation to undertake arduous farm operations and maintenance (eg. additional fencing);
- less time and interest to participate in producer networks and activities, particularly those focused on commercial farmers (eg. livestock improvement groups);
- less interest by children to pursue farming as a career option, and unlikely to be interested in the transfer of the farm within the family; and
- less interest in investing in expensive or risky long-term NRM strategies.

SECTION 3: INDICATORS OF THE SOCIAL DIMENSION OF LAND-USE

Overview

This section outlines a practical methodology for regional natural resource management (NRM) authorities, such as Catchment Management Authorities, to collect and analyse a range of data to increase understanding of the social dimension of land-use. Such an understanding will assist inform investment decisions made by CMA and meet reporting requirements. This report draws on detailed research recently conducted by Charles Sturt University and the New South Wales Department of Primary Industries that explored the social dimension of land-use within the rural district of Boorowa, in the Lachlan CMA region of NSW.

This research has identified a methodology that can be undertaken relatively simply to provide a baseline of information about the social dimension relevant to NRM at the regional scale and that subsequently, will enable agencies to track progress of the social dimension of NRM at the regional level. In NSW, the recently established Natural Resources Commission has developed a suite of standards, targets and indicators relevant to NRM, which now acts as an assessment and reporting framework for CMA. The methodology described in this report is designed to collect and analyse existing and new data to understand landholder's current practices, capacity to adopt recommended changes and future aspirations – critical information for making long-term investments to optimise NRM.

LAND-USE IN RURAL AUSTRALIA

Forces shaping Australian farming

Since Europeans began clearing the bush and ploughing the soil in the 1800's, Australian agriculture and its people have continued to change (Pollard, 2002). Not only are we changing the way we farm, but also who is doing the farming. Much has been written in recent years about the structural change in agriculture and the associated difficulties for rural communities (Lawrence, 1987, Alston, 1991, Barr and Cary, 1992, Vanclay and Lawrence, 1995, Lawrence, 1996, Pritchard and McManus, 2000, Gray and Lawrence, 2001, Cary *et al.*, 2002, Barr, 2005). Alston (2004) argued the combination of globalisation and government policies in support of unregulated markets to determine the nature and location of farming, has caused uncertainty for regions and farmers with limited agronomic potential and few financial reserves.

Peter Corish, recent President of the National Farmers Federation, acknowledged that Australian farmers are likely to face continuing pressure due to cheaper production elsewhere in key price-driven commodity markets (eg. beef, wool) (Corish, 2004). Although there is a steady decline in the number of farmers, approximately 1-2% p.a. over the past 20 years (ANRA, 2001), Australian agriculture is still dominated by farm families (Alston, 2004). Others have reported a growing divide between wealthy and poor farmers in Australia, with the top 20% of farm business generating incomes over \$100,000 p.a. (Gray and Lawrence 2001), yet the bottom 20% of farms generate less than \$10,000 p.a. (Garnaut *et al.*, 1997, cited in Alston 2004). There has been a general decline in the terms of trade (profitability) for Australian farming since the mid-1970s, although the viability of specific farm sectors, regions and producers varies markedly (ANRA, 2001). The Agriculture and Food Policy Reference Group's recent report to the Australian government's Minister for Agriculture outlined strategies so that Australian agriculture can adapt and remain viable [refer to Box 4].

Box 4 Strategies to enhance Australian agriculture

Box 4 Strategies to enhance Australian agriculture

- A stronger emphasis on innovation in production and marketing, underpinned by leading edge research and development, is fundamental to longer term business success.
- Sound macro-economic and micro-economic policies, supported by substantial on-going investment in infrastructure, will be vital to low cost, globally competitive sectors.
- A whole-of-chain, paddock to plate approach is needed to service consumer requirements efficiently and effectively.
- Policies must focus on achieving greater self-reliance of business operators.
- The regulatory burden facing businesses must be reduced.
- Relevant information must be communicated in a clearer, more timely, accessible and accurate manner.
- A partnership approach between businesses and governments will bring the best longer term improvements to the sector's viability and sustainability.
- A genuinely cooperative and consistent approach by governments – Australia, state and territory – is essential for policies and programs affecting the sector.

Source: Agriculture and Food Policy Reference Group (2006).

While several analysts have predicted increasing pressure for Australian farmers (Lawrence, 1996), there is uncertainty about the most effective role and means for government to assist farm families and rural communities cope with increased pressure – even if choosing to exit the agricultural sector. For example, Botterill (2002) reported that the Australian government has made available financial assistance for those exiting farming for more than 30 years, viewed by some as an incentive to free up farmland for more efficient and productive landholders. Yet such incentives have not necessarily been effective, using economic incentives for a segment of farmers who are largely motivated by non-economic factors (Botterill, 2002). That is, despite poor economic returns from agriculture, families may choose to remain on their farm for the lifestyle, or because they have opportunities to supplement their household income from off-farm sources.

Diversification and innovation is often cited as a strategy for farmers to prosper, however others are more circumspect arguing that major technological shifts in agriculture create winners and losers as the frontiers of agriculture shift (industry standards, market expectations, consumer demands) (cited in ANRA, 2001). Not all farm families have the same capacity to exploit the opportunities in agriculture, with major changes in agriculture sometimes bringing benefits to some and creating costs for others. Barr (2001) reported that the increasing median age of farmers reflects the decline in the number of younger farmers and the delayed exit by older farmers – the median age of farmers increased from 48 to 50 years during the years 1996 to 2001 (Barr, 2004), yet this trend is more pronounced in some industries and landscapes. In contrast to the common scenario of rural decline, recent research by Barr *et al.*, (2005) identified parts of rural Victoria where there is increasing demand for farmland for its amenity values, rather than agronomic potential. In an ironic twist, some small country towns originally established due to the agronomic potential of the district are now in amenity landscapes ‘... have a more secure future because of the limited prospects for agriculture’ (Barr, 2005, p.x).

Agriculture has an integral relationship with surrounding rural communities – with the prosperity of both closely tied. A decline in farm families often correlates to a decline in a small rural community's population. However, changes in population of rural communities is

not always a simple linear relationship with farming numbers, as 60% of Australian rural towns, especially coastal towns with more than 5,000 people, are expanding (Tonts, 2000, cited in Alston 2004), as people move to closer to health and educational services, improved employment opportunities and for enhanced lifestyles.

Not only have some rural towns increased in population, but they have also changed in composition – with new residents sometimes having quite different values and expectations to that of an erstwhile farming community (Bryant 1999, cited in ANRA, 2001). Passfield *et al.* (1996) speak of these changes creating a post-modern rurality in which newcomers may even demand farmers change their practices so as not to impinge upon their ideals of rural life, perhaps denying the activities of production that may have occurred for the previous century or more. Some rural towns and landscapes have seen a resurgence in population in the past decade, particularly towns and farmland with high aesthetic qualities, and in proximity to capital cities (2 hours drive) and regional centres (1 hour drive). Yet the changes in composition to rural communities and landscapes can be complex. The social and economic restructuring that occurs in rural areas to suit the lifestyles and values of newcomers can lead to ‘over development’, a process which has the capacity to undermine the very attributes which made the countryside attractive (Tonts and Greive, 2002).

The changing composition of rural communities and the way they manage farmland presents a challenge for natural resource policy, particularly if seeking major changes to the landscape such as for the control of salinity. Providing the right incentives for landholders to undertake land-use change is a complex task, as ‘Even if ... we are able to achieve such landscape changes, there will be a lag of between fifty and several hundred years between implementation and observable outcomes’ (ANRA, 2001, p.1). Given the long delay between the initial investment and tangible returns in terms of salinity control, then it is likely to be a considerable challenge to motivate the current generation of landholders to make the sizable investment needed (ANRA, 2001).

Social landscapes

The Australian environment is often characterised by its native vegetation, land form and water bodies – creating the distinctive qualities for which Australia’s natural environment is world-renowned. In addition, the appearance of most catchments is strongly shaped by human activity (eg. farming, urban development) – that is, the landscape is as much defined by the people and their activities (ie. social landscapes), as it is by the natural environment. It is increasingly accepted that optimising NRM requires an understanding of the social qualities of the landscape (eg. people’s historical and current activities; their values, capacities and aspirations), as well as understanding the environmental qualities. Most CMA and NRM-related agencies have a strong knowledge base of the biophysical qualities of catchments, yet comparatively little knowledge of the social dimension that underpins NRM – although this situation is changing. One aspect that has received increased attention is the ‘social capital’ within rural communities and what is required for improved NRM [refer to Box 5].

The appearance of most catchments is strongly shaped by human activity, and so efforts to improve NRM requires an understanding of the social qualities of the landscape – people’s historical and current activities, their values, capacities and aspirations.

Box 5 Social capital associated with NRM

Box 5 Social capital associated with NRM

Social capital is a concept about the relationships, activities and expectations between people within a community, and between the community and outside organisations. Higher levels of social capital are associated with cohesive and resilient communities, and are often linked with improved NRM (Curtis and Cooke, 2006).

Indicators of social capital relating to NRM can include:

Participation – extent of opportunities for a large proportion of the community to be involved in NRM projects on a frequent basis;

Learning – extent of opportunities for the community to increase their knowledge and skills on relevant NRM issues;

Networks – extent of opportunities for people to be part of inclusive, cooperative, supportive and active networks or associations

Sense of belonging – extent people feel their values are shared and accepted by the wider community, and they ‘belong’ to the community;

Outside partnerships – extent the community has established active links with outside organisations and attracted additional resources;

Confidence and trust – extent people have confidence and trust in agency staff and organisations (eg. shared understanding of critical issues and strategies for improved NRM).

Indicators of social sustainability

Keller (2000) reported that in the USA the leading indicators of whether rural area would prosper or decline, included:

- the presence of quality educational institutions,
- a balance between working and retired populations,
- cluster activities in the local area, and
- sustainable base populations of 5,000 or more persons.

Pepperdine (2000) categorised and formed 15 discrete factors which are represented by the corresponding statements, or indices. The factors and variables they represent are listed in Table 9. This process acted to endorse the majority of statements as indices while also reduced a large number of variables to more manageable factors which reflect rural social sustainability.

Table 9 Factors of Rural Social Sustainability (Pepperdine 2000)

Social Sustainability Factor	
1	Cohesion: co-ordination; ability to work together
2	Community mindedness: community life; active participation
3	Prosperity: population replacement including young adults; positive outlook; property resale
4	Neighbourliness: friendly and supportive community
5	Accepting: different points of view, ideas and newcomers; know neighbours
6	Opportunities to participate in social activities (entertainment, cultural, recreational and sport) and public affairs; presence of motivated and enthusiastic people
7	Employment opportunities including youth and young adults
8	Social disintegration: minimising family breakdown; drugs and crime; suicide
9	Attachment to the area
10	Open minded: open to 'outside' and women
11	Economic viability: time for holiday and leisure; retirement; financial security
12	Community input: community self-reliance; community groups; shop locally
13	Communication: the 'bush telegraph'
14	Unity: volunteerism; common values
15	Population stability

Natural resource management at the regional scale

Since the early-1990's, NRM in Australia has been focused on managing the land, vegetation and water (biodiversity) assets within the boundaries of a water catchment. In parallel, NRM policies and programs by government agencies have been reorganised to match the boundaries of water catchments. An important change in NRM in Australia during this period has been the formation of regional NRM organisations (CMA in Victoria and NSW) – with a CMA, or equivalent organisation, covering each of the 56 NRM regions in Australia [refer to www.nrm.gov.au]. In NSW, the 13 CMA were made statutory authorities under the NSW CMA Act of 2003 and have Boards that report directly to the NSW Minister for Natural Resources.

The CMA have become the primary agency for coordinating the considerable public investment in NRM at the catchment or regional scale. In NSW, the CMA have been allocated a combined budget of \$436 million just from the NAP and NHT to support on-ground works during 2004-07, with an additional \$100 million from the NSW government to cover operating expenses during this period.

In NSW, the CMA are generally still consolidating their roles, operations and relationships with the many stakeholders. A large effort has been made by the CMA to prepare integrated NRM plans – Catchment Action Plans (CAP), to guide investment across a suite of programs, with each plan required to consider all environmental, social and economic impacts of natural resource decisions on a regional basis.

One challenge for many CMA has been to strengthen the information base on which to make long-term investment decisions. This is particularly challenging, as many aspects of NRM require considerable investment in on-ground works and changes to land-use many years in before the desired outcomes become apparent. For example, addressing severe issues associated with dryland salinity and poor water quality may take 10 to 20 years, yet CMA are required to make investment decisions with a 3 to 5-year timeframe (ANAO, 2004).

A challenge for many CMA has been to strengthen the information base on which to make long-term investment decisions, particularly as many aspects of NRM require considerable investment in on-ground works and changes to land-use for many years before the desired outcomes become apparent.

There is broad acknowledgment that optimising NRM outcomes requires attention to environmental, social and economic aspects. Various governments have developed standards and targets to act as a framework for how integrated NRM can be achieved.

In 1996, a comprehensive assessment of the health of Australia's natural resources was released – State of the Environment Report – which called for a set of indicators to be developed to better gauge NRM [refer to www.deh.gov.au/soe]. In 2002, the Australian government's NRM Ministerial Council released a National Framework for NRM Standards and Targets to guide program implementation and assess performance towards achieving the 'triple-bottom line' for NRM (revised on 8 April 2003) [refer to www.nrm.gov.au]. Subsequently, the NSW government established the Natural Resources Commission (NRC) in 2003 to provide the government with independent advice on a range of NRM issues, and develop standards and targets for NRM in the State [refer to www.nrc.nsw.gov.au].

The core functions of the NSW NRC are to:

- recommend state-wide standards and targets for NRM;
- review and recommend the approval of CAP developed by the 13 CMA; and
- audit the implementation of the CAP by the CMA, and assess their effectiveness in achieving state-wide standards and targets.

The NSW government has recently adopted the NRC standard and targets for NRM (February 2006) [refer to Box 6]. The government now requires all CMA to comply with the standard as a mechanism to ensure that "... investment in NRM is efficient and effective, consistent with community values and promotes achievement of the adopted state-wide targets" (NRC, 2005).

Box 6 Natural Resources Commission's Standards for good NRM

Box 6 Natural Resources Commission's Standards for good NRM

1. **Collection and use of knowledge** (use of the best available knowledge to inform decisions in a structured and transparent manner).
2. **Determination of scale** (NRM issues addressed at the optimal spatial, temporal and institutional scale).
3. **Opportunities for collaboration** (collaborate with other parties to maximise gains, share or minimise costs of delivering multiple benefits).
4. **Community engagement** (meaningful engagement of the community in the planning, implementation and review of NRM).
5. **Risk management** (consideration and management of all risks to maximise efficiency and effectiveness, and minimise adverse impacts).
6. **Monitoring and evaluation** (quantification and demonstration of progress towards goals and targets, and use of results to guide improved practice).
7. **Information management** (manage information in a way that meets the needs of users and complies with formal security, accountability and transparency requirements).

Source: NSW Natural Resources Commission (2005).

The NRC also developed a set of seven 'macro-environmental' targets and six 'specific priority' targets – essentially aiming for improvement (or protection) in the quality of all components of the natural environment by 2015, and that improved NRM contributes to economic sustainability and social well-being.

Indicators of social processes employed by Catchment Management Authorities

As discussed above, NRM is defined by people's historical and current activities, their values, capacities and aspirations. As recognised by the NRC, engaging with rural communities and organisations to improve NRM is a core function of CMA. To comply with the social dimension of the State-wide targets and indicators (element for measurement) identified by the NRC (2005), it is expected that CMA have, or will have, social processes that have (*authors have prepared example targets*):

- identified the cross-section of stakeholders in the NRM region (eg. people, groups, organizations and industries) (*Example target = all stakeholders and their connection to NRM identified*);
- understood the issues, capacities and aspirations of the different stakeholders (*Example target = primary stakeholders' issues, capacities and aspirations documented and analysed in key NRM documents*);
- designed a process to meaningfully engage stakeholders in NRM (*Example targets = high proportion of stakeholders engaged in NRM activities; high level of satisfaction amongst stakeholders with engagement processes; clear and feasible NRM plans have resulted from engagement processes*);
- addressed the constraints faced by different stakeholders to changing practices to improve NRM (*Example targets = NRM agencies have developed a suite of incentives and support to match needs of stakeholders; high level and proportion of uptake of incentives and support by stakeholders*);
- empowered stakeholders to have increased knowledge, be better skilled, and greater confidence to undertake improved NRM (*Example targets = high proportion of*

stakeholders have undertaken NRM-related training in the past 3 years; high proportion of stakeholders are implementing NRM-related work);

- fostered stronger mutually-beneficial partnerships between different stakeholders (*Example targets = high proportion of stakeholders involved in partnership activities; high proportion of partnership activities lead to NRM-related works);* and
- improved NRM which leads to and supports aspirations of all stakeholders (*Example target = high proportion of stakeholders who feel improved NRM corresponds to improved quality of life and business viability).*

Some of these indicators relate to concepts that underpin the NRC's Target 12 – 'Natural resource decisions contribute to improving or maintaining economic sustainability and social wellbeing' [refer to Box 7], for which NSW DPI has been identified the lead agency for monitoring and reporting. Social wellbeing is used interchangeably with 'quality of life' (Eckersley, 1998) and 'liveability' (National Economics, 2003), using measures that go beyond just the material/physical components of people's lives. The authors of this report have prepared indicators and examples of targets for Target 12 [Box 7].

Box 7 Indicators for NRC's Target 12

Box 7 Indicators for NRC's Target 12

'Natural resource decisions contribute to improving or maintaining economic sustainability and social wellbeing'

- involvement of recognised independent experts to review major decisions of, and plans for, NRM (*Example target: Annual review of CAP and supporting activities by an expert panel);*
- spatial, temporal and social variations of the costs (trade-offs, opportunity costs, risks) and benefits identified and acknowledged in major NRM planning fora and documents (*Example target: Relevant economic and social research undertaken every 5 years that clearly show the costs and benefits associated with major investments in NRM);*
- extent partnerships have formed between different individuals, groups and organizations relevant to NRM (*Example targets: High proportion of stakeholders are actively involved in mutual planning fora and implementation activities; High proportion of the community involved in groups with goals and activities consistent with NRC's NRM goals);*
- extent commercial farmers and private businesses are active and co-investors in NRM networks and activities (*Example targets: High proportion of commercial farmers actively involved in NRM networks and activities; High proportion of private businesses supporting/sponsoring NRM networks and activities);*
- extent the goals and activities of businesses (public and private) are consistent with NRC's NRM goals (*Example target: High proportion of businesses have 'triple bottom line' assessment and reporting protocols).*

Indicators of landholders' capacity and willingness to change land-use

Even when landholders are engaged in social processes facilitated by CMA and other agencies, there can be a wide variation in the capacity and willingness of individual landholders and farm families to adopt new practices to improve NRM. Research by CSU and others has developed a set of indicators that are valuable for informing agencies about the capacity and willingness to change land-use, as outlined below. In summary, the level of

household income and its dependence on agriculture, preferred lifestyle and long-term plans, have a strong correlation on the capacity and willingness to undertake land-use change.

The level of household income and its dependence on agriculture, preferred lifestyle and long-term plans, have a strong correlation on a landholder's capacity and willingness to undertake land-use change.

Landholders with a low dependence on agriculture for household income (eg. part-time or hobby farmers) tend to be more willing to invest in land-use change if it:

- appeals to lifestyle goals (eg. more convenient farm management, vegetation management that improves their property's aesthetic qualities), rather than strategies focused on increasing primary production (eg. liming to reduce acid soils), and
- adds to the capital value of their property (their interest in an increase in capital value over the long-term can be higher than their interest for a small annual income from the property).

Landholders with low levels of household income are unlikely to be able to incur the:

- financial costs of new practices (even if reimbursement is offered),
- risks of failure (eg. pasture establishment may not be successful in the first season, potential farm forestry markets may not eventuate), and
- immediate impact of reduced production, and therefore reduced income (even if long-term production and income may be higher).

In addition, landholders with long-term plans (>10 years) to remain living on the property, change their farm management (eg. reduce intensity of farm management), or transfer the property within their family, can sometimes be willing to invest in farm business and NRM strategies that are uneconomic in the short-term (eg. building up a cattle herd, liming to reduce acid soils, establishing corridors of native vegetation) (Byron *et al.*, 2004). Although in general, the type of NRM strategies landholders adopt tend to reflect their level of interest in, or dependence on, agriculture as their primary source of income, and the level of their current household income.

Through this project and previous research, useful indicators to generate baseline information to estimate landholders' capacity and willingness to invest in specific NRM strategies include:

- **Property size and enterprise type** [using 'best practice' guidelines prepared by agricultural agencies for different agronomic zones, approximate farm income can be estimated];
- **Rural land value** [using land value data prepared by the State's Valuer General, an insight into the extent of influence of agriculture on district land values. Also, long-term trends of land values can be indicative of the underlying values held by landholders; such as land values that reflect the commercial agronomic potential can indicate landholders supportive of, and dependent on, primary production];
- **Level of household income and proportion from off-farm sources** [this data gives an indication of the dependence on agriculture, and what NRM strategies may appeal; such as a low dependence on their rural property for household income can indicate a preference for NRM strategies that enhance the qualities of their lifestyle, such as more convenient farm management, or improved aesthetic qualities];
- **Long-term plans for their property** [information about whether landholders are intending to intensify, expand or reduce property size and management, and the extent

they are likely to pursue recommended practices, can assist determine relevant NRM strategies]; and

- **Involvement in NRM** [information of the level of engagement by landholders in NRM programs and industry forums, such as production-focused discussion groups or short-courses, often corresponds to the level of knowledge and confidence in the recommended practices].

UNDERSTANDING THE SOCIAL DIMENSION OF RURAL LAND-USE

Defining ‘community’

The 13 CMA in NSW are developing CAP that are consistent with the NRC’s state-wide standards and targets (CAP to be finalized by June 2006). Well-developed targets and indicators (ie. SMART – targets that are simple, measurable, achievable, realistic and time-bound) are useful to guide investment and track progress towards long-term goals, and are particularly useful in NRM given corrective action may take beyond a decade to achieve improvement in the condition of key environmental assets.

Understanding the nature of community diversity is vital to ensuring the CAP – the principal documents to guide the considerable public investment in NRM – are appropriate, realistic and achievable within the prevailing social context. Even when different groups of people within a single community share the same long-term NRM goal (eg. healthy biodiversity), the strategies to achieve this goal may need to be markedly different for specific groups within the community. Different groups can vary widely in terms of their:

- specific interests in NRM (eg. waterways for fishers, soil health for farmers, reserved forests for bushwalkers);
- dependence on natural resources for their household income;
- capacity for change to improve NRM (eg. limited knowledge optimum NRM, low household income, limited time for undertaking optimum NRM); and
- willingness to make changes to their own lifestyles and businesses for long-term public benefits.

Even when different groups of people within a single community share the same long-term NRM goal, the strategies to achieve this goal may need to be markedly different for specific groups within the community.

It is generally accepted that defining the ‘community’ for NRM is an important foundation task, yet it is often done at only a superficial level. A ‘community’ can be defined as a group of people who are drawn together through a common situation or interest. The common definition of ‘community’ is a group of people sharing a locality (ie. place-based definition). However, a community can also be formed when people share a common interest or identity, such as belonging to a single profession, ideology or interest group. Furthermore, what makes the concept challenging to understand is that people can belong to multiple communities, simultaneously – in effect, people express their sense of community in a variety of ways (eg. via membership of formal clubs, employment in a specific sector, participation in social networks).

There can be too much emphasis on place-based communities and insufficient recognition that improved NRM may require initiatives to be delivered in a way that is consistent with other definitions of community within a catchment. Varying communities within a single NRM region, particularly when people’s communities overlap and are inconsistent in values and

purpose, presents an obvious challenge to CMA needing to work with a ‘community’. Questions typically being asked by CMA include:

- how do we define and identify the community?
- how do we engage with the community?
- how do we understand the community’s views?
- how do we work with the community to design the CAP and improve NRM?

Stakeholder analysis

As discussed above, an important part of NRM planning is having a sound understanding of the community – the key social segments, their views on NRM issues, their willingness and capacity to change, and their short and long-term aspirations. The CAP need to be cognisant of the social context of the regional community, otherwise the policies, programs and activities of the CMA and other NRM agencies risk being misinformed, poorly targeted and, ultimately, unsuccessful in achieving the NRM goals. ‘Stakeholder’ is a term used to describe people, a community or organisation that is (or potentially) affected by an activity or policy – people who have a stake in the outcome. People will not always be affected by an activity or policy to the same extent, nor equally. For example, some people may incur immediate costs while others may experience costs in the long-term. A single approach to improving NRM is unlikely to be effective in regions with a diverse community. Social scientists commonly advocate that a thorough stakeholder analysis be undertaken in the preliminary stages of planning to ensure NRM is oriented to the social context.

People will not always be affected by an activity or policy to the same extent, nor equally. A single approach to improving NRM is unlikely to be effective in regions with a diverse community.

A stakeholder analysis can be a relatively inexpensive task, yet can yield valuable information about the social heterogeneity (community diversity) within a region to allow the:

- cross-section of social segments (stakeholder groups) to be identified;
- stakeholder groups to be prioritised for different elements of NRM;
- CMA to recognise the different issues, capacities and aspirations of each stakeholder group;
- positive and negative impacts of a policy, program or activity to be anticipated;
- NRM strategies to be designed and implemented in a manner that is consistent with the capacity, interests and aspirations of each stakeholder group;
- evaluation of the nature and scale of involvement, level of satisfaction, and adoption of ‘best practice’ NRM by each key stakeholder group; and
- analysis, reporting and refinement of CMA programs and activities to ensure long-term NRM goals are likely to be achieved.

A stakeholder analysis usually groups people on the basis of how they will be affected by an initiative, analyses the nature of the impacts, how the initiative will minimise any negative consequences and maximise the positive outcomes. A template for a stakeholder analysis is provided as an example in Appendix 1.

The research process and findings undertaken in the Boorowa district by this project is consistent with the key lessons from recent NRM and agricultural improvement programs, such as *Heartlands* [refer to Box 8] and *Sustainable*

Grazing Systems [refer to Box 9]. At a more generic level, research has identified key elements of effective arrangements between agencies and landholders (Simpson and Chudleigh, 2006) [refer to Box 10].

Box 8 Key lessons from Heartlands

Box 8 Key lessons from Heartlands

The *Heartlands* program developed strategies for targeting land-use change to improve NRM in selected catchments in southern NSW and northern Victoria during the early-2000s. Key lessons of the approach used include:

- Discovering the values, attitudes, aspirations and concerns of local communities is a fundamental step in the process of land-use change.
- Effective local implementation staff is a key element in achieving improved NRM.
- Technical support for catchment coordinators (eg. interpreting research) is required to ensure that on-ground works are targeted for maximum effectiveness.
- A participatory research approach engendered community interest and support for improved NRM.
- A diverse but complementary set of approaches is required to encourage well targeted land-use change.
- The use of a variety of methods is appropriate for communicating and engaging with local communities.
- Efforts to promote land-use change that require long-term commitment from landholders are put at serious risk when financial assistance and other commitment by governments is limited to short-term projects with inflexible delivery timelines.

Source: Earl and Cresswell (2005).

Box 9 Key lessons from Sustainable Grazing Systems

The management team reported the critical factors behind the success of the national SGS program were the:

- combination of research, a producer network, and a training program proved highly effective;
- whole program achieved a critical mass, which allowed allocation of sufficient resources;
- program goal based on the *delivery* (implementation) of services and activities.
- stability of personnel throughout the 5-year program.
- well-defined baseline information at the commencement of the program;
- broadly based steering group (eg. included farmers, researchers);
- strategic reviews (eg. external evaluation at mid-term).

Source: Meat and Livestock Australia (2002).

Box 9 Key lessons from Sustainable Grazing Systems

Box 10 Arrangements to enhance natural resource management

Box 10 Arrangements to enhance natural resource management

- Institutional arrangements for delivering incentives must recognise the diversity among land managers and their particular needs and preferences.
- Where appropriate, and opportunities arise, ‘brokering’ group activities and encouraging collective responsibility approaches will assist in working towards landscape-scale change.
- Institutional arrangements for delivery of incentives should ensure that information on incentives and their applicability to particular situations is available to land managers.
- Community engagement and feedback mechanisms are essential elements in modifying the delivery of incentives and associated institutional arrangements. Early detection of negative community reaction to incentives allows for incentives to be adapted so they are locally relevant.
- Community engagement in incentive programs is more likely to be effective if the local community trusts the agency and personnel.
- Institutional arrangements for delivering incentives should encompass strategies and resources for capacity-building, including management and technical skills of land managers, to ensure that local actions contribute to regional NRM targets.
- To ensure committed staff and a sense of security in the community, institutional arrangements for incentives must include adequately paid professionals with employment security and professional development opportunities.
- Effective coordination between government agencies and amongst regional groups is essential to ensure land managers receive accessible and accurate information.
- Adequately resourced, rigorous monitoring and evaluation of incentives and their impact is essential to ensure incentives are having the intended outcomes in relation to regional NRM targets.

Source: Simpson and Chudleigh (2006).

Tracking progress towards ‘social’ targets

As outlined above, the NRC has established a planning, operating and reporting framework for all CMA in NSW. A cost-efficient and effective methodology is needed for CMA and other NRM agencies to guide the collection and analysis of information relevant to the social dimension of NRM at the regional scale. Given preliminary training, adequate resourcing and experience, CMA and other agencies can be expected to undertake a stronger role in generating and analysing the information necessary to interpret the social dimension of NRM. In addition, it may be more effective for regional NRM organisations to establish links with, or commission, specialist expertise of qualified social scientists – as with other disciplines of science, assumptions about the relative ease and efficacy of social science should be avoided.

NRM agencies are expected to generate and analyse the social dimension of their work, which may require establishing links with specialist social science expertise.

Research undertaken in the Boorowa district indicates that a simple integrated approach to research can be informative about the social dimension of NRM at the regional level – with a suggested methodology discussed below.

Collecting relevant data

The goals and targets of CMA, as articulated in the CAP, are framed in terms of improving (or protecting) the condition of the major components of the environment within a region. The CMA are developing a suite of strategies – an integrated series of policies, actions and targets – to optimise NRM at a regional scale.

These strategies need to be consistent with the needs, capacities and aspirations of the key stakeholders to improve NRM. It is essential to establish baseline information on the key elements of NRM to be able to gauge progress (or otherwise) towards achieving immediate and long-term goals. This applies to the biophysical assets as well as the institutional and social dimensions of NRM.

Once a thorough stakeholder analysis has been conducted – providing important baseline information about the people directly affected by NRM in the region, then people-centred targets and indicators relevant to the NRM region can be developed. Without baseline social information, it is difficult to develop targets and indicators that are SMART, and so risk the considerable investment made in NRM being misinformed, inefficient and unsuccessful.

While comprehensive social research can provide an accurate picture of the social dimension of NRM within a region, this can be expensive, time consuming and may be unnecessary once the baseline information is established. An abridged approach may enable skilled and well-supported CMA staff to coordinate, and undertake much of, the data collection and analysis to generate meaningful information to support the CMA operations – program design and implementation, evaluation and reporting, and long-term strategic planning. While there is a wide range of methods that can be used with rural communities to collect and analyse data (Coakes, 1999; Aslin and Brown, 2002), the methods in the approach discussed below should be viewed as suggestive rather than prescriptive.

The key steps of this approach, discussed in more detail below, include:

1. Draw on and analyse existing social, economic and agronomic data (eg. data from NSW Lands, NSW DPI, ABS Census, commissioned research);
2. Conduct meetings or workshops with groups of experienced people (in individual stakeholder groups) to explore selected topics (often working with recognised groups and representatives);
3. Conduct interviews with a limited number of people across the full spectrum of stakeholders, focusing on people who are less active in recognised groups and formal consultation processes; and
4. In-depth analysis of a small number of informative case studies (eg. representative farm families, industry sectors, innovative organisations).

Analysis of existing data

There is a wide range of data available on the social, economic and agronomic aspects of land management – much collected on a regular basis. While existing data is unlikely to answer specific questions posed by CMA, it can be valuable for creating a socio-economic profile of key stakeholders and improving understanding of the prevailing socio-economic context. For example, existing data can create a useful socio-economic profile of landholders by analysing the property size and enterprise type; rural land value; level of household income and proportion from off-farm sources; long-term plans for their property; and their level of engagement in NRM activities. Information on these aspects of farm management can have important implications for the strategies used by CMA and other agencies.

A reasonable understanding of the level of income derived from farming can be obtained by using the figures for property size, land-use and carrying capacity of the ‘typical’ farming property in a district (as determined by NSW Lands, refer to www.lands.nsw.gov.au), and multiplying these with the profitability of ‘best practice’ operations for the main farm enterprises (as determined by NSW DPI, refer to www.dpi.nsw.gov.au). For example, calculations of income levels from farms in some NSW districts where wool sheep is the dominant enterprise, generating a gross margin of \$10,000 for 1,000 wethers (NSW DPI, 2005), are presented below in Table 10.

Table 10 Typical property sizes, productivity and land values in selected districts, NSW.

Locality	Farm area (Ha)	Carrying capacity	1996	2006	Farm enterprise profit
			land value	land value	
Boorowa	302	1,700	\$240,000	\$546,000	\$17,000
Mudgee	943	3,200	\$350,000	\$759,000	\$32,000
Orange	238	3,000	\$385,000	\$1,350,000	\$30,000

Source: NSW DPI (2005) and NSW Lands (2007).

As discussed previously in more detail for the analysis of the Boorowa district, if the level of farm income is well-below the level considered necessary for a sustainable farm business over a prolonged period (exact amount varies depending on several factors, including household size, number of dependents, costs and liabilities), then it is likely that other sources contribute to the overall household income. As such, households that have little dependence on farming for income are unlikely to be motivated by NRM strategies that aim to improve farm production (eg. liming to reduce acid soils, erecting new fences for controlled grazing).

Based on the figures presented in Table 10, the typical farming property in the Boorowa district only generates an income from farming at one-third the level considered necessary to support a family and maintain a sustainable farm business. Also, it is evident from Table 10 that the purchase price of farmland in the Orange district far exceeds the agronomic potential for sheep grazing and, arguably, most other farm enterprises, suggesting land is being purchased for reasons other than commercial farming.

If the purchase price of farmland far exceeds the property’s agronomic potential, then it is likely that land is being purchased for reasons other than commercial farming.

The NSW Department of Lands (NSW Lands) generates data for other farm enterprises (eg. cropping farms, hobby farms) that are ‘typical’ for a wide range of districts in NSW, and similarly NSW DPI has calculated the profitability of ‘best practice’ operations for several enterprise types.

Data collected by the Australian Bureau of Statistics (ABS), via the 5-yearly census of Population and Housing (the last Census was conducted on the 8th August 2006), provides information on the size and composition of the population for a Local Government Area (LGA) [refer to www.abs.gov.au]. The regions covered by a single CMA include several LGA, so allow information to be compiled and analysed with a reasonably good match between LGA and individual NRM regions. Useful information produced by the ABS for NRM includes:

- population size and growth rate (across age, gender and ethnicity cohorts), and
- employment level and industry sector.

Information on these social attributes can be informative, for example, if there is consistently strong population growth, then it is likely to generate a high level of economic development (eg. demand for new housing) and increasing pressure on key natural resource assets (eg. increasing demand for clean and reliable water supplies). Farmland neighbouring centres of high population growth (ie. in the peri-urban zone) is likely to be valued less for its agronomic potential and increasingly for its potential for small 'lifestyle' farms or urban development (Buxton *et al.*, 2006). In such situations, it is unrealistic to expect the current landholders to make long-term investments in NRM based on the assumption that they will remain farming well into the future (eg. liming to reduce soil acidity). The increasing value of land beyond its agronomic potential – regardless of whether the property is sold or not – is likely to force changes to the farm's management (eg. annual land tax will increase even though farm income may not, reduced community acceptance of farm activities such as herbicide spraying).

Farmland neighbouring centres of high population growth is likely to be valued less for its agronomic potential and increasingly for its potential for small 'lifestyle' farms or urban development. The increasing value of land beyond its agronomic potential is likely to herald changes to the farm's management.

The level of employment within broad industry sectors (eg. Agriculture, Fisheries and Forestry) and percentage change over time can give an indication of the extent of dependence a community has on different industry sectors. This can be informative, for example, if prolonged periods of well-below average rainfall occur (eg. a drought), then this will have a large impact on a community with a high proportion of the community employed within the agricultural sector.

Commissioned socio-economic and demographic research can be useful even if produced for another region or purpose. The closer a given NRM region reflects the socio-economic and environmental characteristics of another region, the more likely that research findings can be meaningfully transferred. For example, valuable information about the rate of turnover of rural properties (ie. sale outside or transfer within the family) has been collected for selected catchments, with results indicating that 30-50% of rural properties will change hands within 10 years (Byron *et al.*, 2004; Curtis *et al.*, 2000 and 2006). This has important implications for the extent NRM skills and knowledge will be retained within a community, and the need for NRM agencies to regularly renew relationships with landholders – valuable information even though this data was collected in just a few NRM regions.

Social benchmarking research undertaken by mailed surveys completed by a statistically representative sample population (eg. Curtis *et al.*, 2005) is more expensive than the methodology outlined in this report, however such research can collect data specifically tailored for the needs of CMA (eg. landholder characteristics, values and long-term intentions and these data can be being spatially referenced).

As with any information source, caution needs to be applied when drawing on data collected in a different setting (eg. different location, purpose, time period), as no two settings will be identical.

Workshops with experienced people

A current stakeholder analysis will identify the important stakeholder groups for each key environmental asset. The categories of stakeholders can include both formal and informal groups of people, such as large public organisations and small private businesses, incorporated interest groups (eg. anglers club, farm production group, Landcare group), and people who simply share an interest (eg. bushwalkers). Valuable information can be obtained from a well facilitated workshop of 10-15 people with in-depth experience on selected NRM topics. A

workshop with experienced people can generate a wide range of information useful for NRM, including:

- history of land-use within district;
- broad social segments of the community, and their issues, capacities and aspirations;
- major pressures influencing NRM;
- perceptions of NRM agencies held by the community, and areas for strengthening relationships; and
- critical feedback on current (proposed) strategies used by NRM agencies.

The number of workshops required within a region should be sufficient to allow in-depth input by all major stakeholder groups (via representatives and individuals), yet should not be onerous on either the NRM agency or stakeholder groups. Ideally, workshops should generate information that is useful for NRM agencies as well as for stakeholder groups themselves (eg. useful for the group's annual planning).

There is a tendency for workshops to largely attract the participation of people and groups with available time, the confidence to contribute to an interactive process, and who are familiar with NRM organisations – as such, the 'voices' of some people and groups can be over-represented in the information generated from workshops.

Interviews with community cross-section

To counter the risk of information being biased towards the issues, views and aspirations of those capable and confident of participating in workshops, it is important to also seek the views of a wide range of people who are not engaged in NRM via formal groups. For example, notwithstanding the success of the Landcare program in improving NRM, at a national level the majority of farmers are not active members of a Landcare group – and so the views of non-members may not be understood and expressed by leaders of Landcare.

Conducting one-to-one interviews by experienced interviewers with a cross-section of landholders is likely to generate balanced information to support NRM. The cross-section of landholders should include people with a mix of characteristics according to:

- age,
- gender,
- ethnicity,
- property size,
- location,
- land-use and enterprise mix,
- dependence on farm income,
- occupation,
- number of dependents,
- membership of NRM and production groups, and
- long-term plans for farm property.

A list and contact details of potential interviewees can be compiled via discussion with a mix of local people (eg. NRM agency staff, Shire staff, stock and real estate agents, school teachers, sport and recreation club leaders, church leaders, long term residents). Interviews should aim to elicit landholders' views NRM issues, constraints and opportunities for change, their aspirations, and preferred sources of information. To avoid influencing responses by interviewees in favour of (or against) a specific organisation, it can be best if interviews are conducted by skilled independent interviewers. Conducting semi-structured interviews with 30-60 landholders across an NRM region in person or via telephone is likely to generate valuable information about the social context of rural land-use.

Informative case studies

In-depth analysis of a small number of case studies can be an informative and efficient means of understanding complex outcomes of policies or practices. The case studies may be informative about a widespread experience or practice (eg. how farm families cope with low farm incomes), or about an innovation that may have wider application. Case studies can also be a useful means of illustrating how changes can be made by individuals and groups to improve NRM; although there is limited value in overt promotion of unrealistic examples that do not match the capacities and aspirations of the target audience. For example, there is little value promoting the benefits of intensive commercial farming if few people aspire to be full-time farmers. Also, a focus on highly successful people or businesses (ie. atypical people or businesses) may have little appeal to others if they do not believe they have the same capacity or opportunity for success.

Consultation with a mix of local people (as undertaken to identify potential interviewees, see discussion above) is likely to identify a small number of case studies that are informative, and reflect the capacities and aspirations of the target audience.

Participatory processes need to be carefully planned and facilitated to ensure the diversity of views relevant to NRM are incorporated into decision-making processes. An effective community engagement strategy will often combine a range of approaches.

SECTION 4: CONCLUSION

EMERGING MULTI-FUNCTIONAL LANDSCAPES

During the past 150 years, the rural landscape in much of NSW has largely been defined by primary production, namely a mix of cereal cropping, livestock and dairy farming, and commercial forestry in native and plantation forests – a landscape of primary production. Until the late-1980s, most of the small towns and regional cities remained highly dependent on the primary production industries for their prosperity.

Some emerging research indicates that in recent years, many of these same towns and regional cities are uncoupling from their dependence on primary production (eg. peri-urban landscapes) (Buxton *et al.*, 2006). There are clear signs that the rural landscape along coastal NSW and other districts is increasingly valued for its aesthetic and environmental qualities, with land prices well in excess of its agronomic potential – parts of the Boorowa district (eg. south-east) are consistent with this trend, as discussed in section 1. For instance, indicators of this change include the:

- urban and rural population is increasing;
- number of rural landholders is increasing;
- number of farmers is decreasing;
- number of small rural properties (ie. 5-40 hectares) is increasing; and
- value of rural land is increasing beyond agronomic potential.

Land prices rising beyond the agronomic potential of rural land is an important signifier of these changes. Rising land prices can increase the options of existing residents, but they can also make it more expensive for farmers to expand their enterprises. Recent research suggests that the subdivision of rural land for amenity values can have a considerable impact on a region's agricultural production (Buxton *et al.*, 2006). Also, long-term farmers and new landholders are likely to have different values, knowledge and skills leading to differences in property management (Curtis *et al.*, 2006). In the context of NRM, important impacts are likely to be on the capacity to protect and enhance water quality, biodiversity and fire management. For example, farmers are more likely to manage weeds and pest animals that impinge on their agricultural production. On the other hand, non-farmers are more likely to adopt practices that address biodiversity conservation, such as fencing creeks or rivers to control stock access to water courses (Curtis *et al.*, 2000).

The analysis of this socio-economic and demographic change is complex. There is some evidence that part of the aesthetic appeal of the rural landscape is the presence of a viable agricultural industry, yet there is also a growing demand for small 'lifestyle' properties and to protect and improve the environmental assets of a region for residents and tourism – a demand for landscapes to be multi-functional.

Part of the aesthetic appeal of the rural landscape is the presence of a viable agricultural industry, yet there is also a growing demand for small 'lifestyle' properties and to protect and improve the environmental assets of a region for residents and tourism – a demand for landscapes to be multi-functional.

If multi-functional landscapes are emerging in many parts of NSW, it raises many questions including:

- can the dynamics driving the socio-economic and demographic change in the region be predicted and managed (by individuals and organisations)?

- does a multi-functional landscape meet the aspirations of the region's community?
- can multi-functional landscapes support viable primary production (agriculture and forestry) at the necessary economy of scale?
- do multi-functional landscapes reach a point of stability (equilibrium), and are they sustainable?
- what are the institutions, policies and strategies needed to create the 'preferred' multi-functional landscape?

International experience suggests that creating the institutions, policies and programs to support a multi-functional landscape that meets community expectations is challenging (Antrop, 2004; Boody *et al.*, 2005; Buxton *et al.*, 2006). In Europe, the initial focus in the 1950's and 1960's on protecting the livelihoods of farmers has become much more complex than simply resolving a tension between urban-rural values. Boundaries that once defined the socio-cultural, economic and geographical dimensions of urban and rural people have become less distinct (Antrop, 2004). Indeed, the fuzziness of multi-functional landscapes presents enormous challenges for governments and organisations responsible for planning land-use, residential development, infrastructure, health and welfare services, community development, and business opportunities (Buxton *et al.*, 2006). In an effort to design multi-functional landscape that meet the social, economic and environmental expectations of society, governments and institutions in Europe have made a large investment over several decades in developing the necessary:

- data collection and analytical capacity;
- decision support tools (eg. landscape models); and
- policies, communication and engagement processes.

UNDERSTANDING THE SOCIAL DIMENSION OF RURAL LAND-USE

Declining productivity of farmland due to dryland salinity is likely to reduce the income from farm businesses, and in turn contribute to a suite of social impacts for landholders. The social impacts of dryland salinity can include:

- increased pressure to obtain income from off-farm sources;
- less time and motivation to undertake arduous farm operations and maintenance (eg. additional fencing);
- declining aesthetic appeal of property and 'sense of place';
- less time and interest to participate in producer networks and activities, particularly those focused on commercial farmers (eg. livestock improvement groups);
- less interest by children to pursue farming as a career option, and unlikely to be interested in the transfer of the farm within the family; and
- less interest in investing in expensive or risky long-term NRM strategies.

However, this research indicated that most landholders do not view dryland salinity as a critical issue for landholders or the wider community, and it is not perceived to be a key driver of the social and economic change occurring in the Boorowa catchment. Reconciling the priorities of NRM agencies and landholders requires in-depth understanding and careful management of the range of sciences that underpin land management.

Generally throughout Australia, expertise and experience in social science issues and methodologies lags behind that for other disciplines of science, and it should not be assumed that regional NRM agencies will necessarily have this expertise and experience within its current staff. It needs to be acknowledged that undertaking social science, like any other discipline of science, requires professional expertise and experience if the information generated is to be valid, credible and meaningful. In which case, effort should be made to establish links with, or commission, the specialist services of qualified and experienced social scientists.

In-depth research of the social context of land-use in Boorowa provided an insight into the dynamics, challenges and opportunities for agencies to optimise NRM. More generally, the research also developed a methodology that can feasibly be undertaken by NRM agencies to gain an insight into why we have the current land-use we do, and what might reasonably be achieved in NRM in the future. While in-depth research was undertaken in the Boorowa district, the methodology discussed in this report is designed to be a feasible approach for regional NRM organisations to monitor and analyse the social dimension of NRM, understand the views, capacities and aspirations of key stakeholders, and assist CMA report against the NRC's standards and targets.

ALIGNING NRM PROGRAMS WITH THE CAPACITY OF LANDHOLDERS

This research indicates that the goals of rural landholders and CMA are broadly consistent – for vibrant rural communities to be living in healthy landscapes. While landholders interviewed for this research generally reported views reflecting a strong stewardship ethic, many have been financially constrained over recent years to give effect to their stewardship ethic by investing in farm to improve NRM. There appears a strong prevailing interest in continuing to improve NRM on farmland, despite an apparent reduced level of activity. This would seem prudent given the lower level of income of farm businesses and continuing drought – both could be expected to increase the risk of some NRM activities (eg. increased risk of failure when attempting to establish perennial pastures or trees).

This research indicated there can be marked differences between landholders and agencies in the immediate priorities for, and strategies to achieve, improved NRM. For example, while dryland salinity may be viewed by some agencies as a critical issue, few landholders in the Boorowa district hold similar concerns. Agencies need to carefully plan NRM strategies so these are aligned with the capacities and aspirations of landholders.

This research also revealed important differences between the aspirations of many landholders and their capacity to invest in NRM works. For instance, interviews and workshop discussions revealed a consistent desire by landholders to establish larger areas of perennial pastures and native trees, and fence livestock out of riparian areas, yet many were currently experiencing severe financial difficulties (principally due to the prevailing drought and low returns for wool) and so were unable to invest in sizeable NRM works – even if the capital works could be rebated by existing CMA support programs. Also, there is an increasing proportion of landholders who are not strongly motivated to invest in recommended NRM works to improve agricultural production, such as the establishment of perennial pastures by small-scale landholders (refer to discussion on multi-functional landscapes, above). These findings appear to have important implications for how CMA engage with landholders and provide support programs.

Despite lower levels of on-ground NRM activities than previously, it may be opportune for agencies to invest in the NRM-focused 'social capital' of rural communities – so when market and climatic conditions improve, rural communities can be 'NRM ready' and readily scale-up on-ground activities. Communities with high levels of social capital – the relationships, activities and expectations between people within a community, and between the community and outside organisations – are linked with individual landholders and communities undertaking works to improve NRM (Curtis and Cooke, 2006). CMA and other agencies can invest in the social capital of rural communities to support NRM by providing opportunities for:

- a large proportion of the community to be involved in NRM projects on a frequent basis (eg. facilitate a mix of activities tailored to different community segments);
- the community to increase their knowledge and skills on relevant NRM issues (eg. provide flexible farm-based training, increase farmer-to-farmer exchange);
- people to be part of inclusive, cooperative, supportive and active networks or associations (eg. increase incentives for landholders to be part of Landcare networks); and
- landholders and agency staff to mix informally and build mutual trust and confidence.

Given the key drivers of land-use change in the Boorowa district – low returns for wool production, continuing drought, and increasing number of non-farming landholders – the Lachlan CMA should carefully consider the suite of support programs it offers. It may warrant the CMA to:

1. Provide the materials for NRM works undertaken by farmers (rather than a financial rebate);
2. Focus on NRM options that increase farm biodiversity and aesthetics for non-farming landholders (eg. offer ecological and landscape design support); and
3. Invest in NRM activities that build ‘social capital’ amongst landholders and the wider community.

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APPENDIX 1: EXAMPLE TEMPLATE FOR CONDUCTING A STAKEHOLDER ANALYSIS

Stakeholder is a term used to describe the people, community or organisation that is (or potentially) affected by an activity or policy – people who have a stake in the outcome. People will not always be affected by an activity or policy to the same extent, nor equally. For example, some people may incur immediate costs while others may experience benefits in the long-term. Also, some aspects of an activity or policy can affect people, while other aspects may not.

Undertaking a stakeholder analysis can be valuable for identifying the key people or groups who may be affected by a specific NRM program. The effects of an NRM program may be beneficial for some people, yet cause negative impacts for others. A stakeholder analysis usually groups people on the basis of how they will be affected by an initiative, analyses the nature of the initiative’s impacts, how the initiative will minimise any negative consequences and maximise the positive outcomes. The following matrix is designed to assist you to undertake a stakeholder analysis for specific NRM programs or projects.

NRM program/project title:

.....

People/group (list in order of importance)	What are the main issues experienced by these people?	What are the positive impacts on their lives/farms by the program?	What are the negative impacts on their lives/farms by the program?	How can the program reduce/avoid these negative impacts?	What are the elements of the program to maximise the positive outcomes?

APPENDIX 2: LACHLAN CMA LETTER OF INVITATION TO WORKSHOPS

1st June 2006

Workshop: Future plans for your property

Dear _____,

You are invited to participate in a half-day workshop to discuss your current and future management of your property, and to identify what strategies are needed to support you in achieving your long-term goals for your property. The workshop is planned for **Tuesday 11th July**, from 9.30 am to 3.00 pm.

The information you generate at the workshop will be critical for the Lachlan CMA and other agencies when reviewing the type of support they can provide to landholders in the Boorowa district and elsewhere. I also hope the information will be useful for your own planning and that of your group.

While the workshop is supported by the Lachlan CMA and Department of Primary Industries, it will be independently facilitated by researchers from Charles Sturt University (Digby Race & Jim Birckhead), who are undertaking research into the current and future land-use in the Boorowa district.

In recognition of the valuable contribution to this research, Charles Sturt University will pay each landholder \$200 for their attendance, and will provide lunch and refreshments during the workshop. Only a small number of people have been invited to participate, covering a cross-section of landholders in the Boorowa district.

Could you please RSVP to me by Friday 23rd June if you are interested in participating in the workshop, and I will forward further details.

With thanks,

David Hilhorst

Catchment Officer,

Lachlan CMA, Boorowa.

Tel: (02) 63851018

Mob: 0429 851 018

APPENDIX 3: PROGRAM FOR ‘PREFERRED FUTURES’ WORKSHOPS

9th & 11th July 2006

Facilitators: Digby Race & Jim Birckhead (CSU)

Location: Ram and Stallion Hotel, Court Street, Boorowa.

Participants: 7-10 people per workshop.

9.30 am Gather for morning-tea/coffee, register name & contact details

10.00 Welcome & introductions

Purpose of workshop & overview of project

Working in pairs to explore:

What I value about living in the Boorowa district is ...

The limitations for me about living in the Boorowa district are ...

Plenary session to identify the major ‘likes’ and ‘limitations’ of life in the Boorowa district.

Working in pairs to explore:

What I value about my property is ...

The limitations for me about my property are ...

Plenary session to identify the major ‘likes’ and ‘limitations’ of individual properties.

12.00 Lunch (provided)

12.30 pm View and discuss issues raised in ‘Country Living 2005’ video

(video produced by Tom Braz *et al.* DPI, August 2005)

1.30 pm Working in pairs to explore:

What I’d like the Boorowa district to be in 10-12 years is ...

What needs to happen to achieve this is ...

Plenary session to identify major characteristics of the preferred future for the Boorowa district, and the major changes required to achieve this future.

Working in pairs to explore:

What I’d like my property to be in 10-12 years is ...

What needs to happen to achieve this is ...

Plenary session to identify major attributes of people’s ‘future’ properties, and the major changes required to achieve this future.

Next steps with workshop results and project

3.00 pm Close