

Understanding rural life – assessing the social dimensions when encouraging land-use changes in rural areas

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Abstract

Meshed with the bio-physical and economic dimensions of rural land-use is a social dimension. Understanding the social and economic dimension of rural communities is critical if agencies are to develop effective policies and programs to improve natural resource outcomes. In this paper, we draw on research of the Boorowa community, located in the south-west slopes of New South Wales, to help understand how social changes in rural communities are impacting natural resource management in the Boorowa district. This included:

- Identifying the catalysts for changing land-use in the Boorowa catchment,
- Presenting an effective and efficient methodology for assessing the social and economic impacts of changes in land use at the catchment scale,
- Identifying feasible and socially-acceptable pathways to achieve change in land-use to manage dryland salinity.

The research process involved assessing data availability for construction of social 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 Catchment Management Authorities might be able to use in their decision-making processes.

Key words: social, natural resource management, land-use change, Boorowa

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1. Introduction

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.

This paper reports project work conducted to consider the social and economic impacts at the farm and community scale of salinity management options. We consider the relationships between forces shaping social and economic change within the catchment and consider the implications of that understanding for natural resource management by agencies and the CMAs. Working in the Boorowa catchment, 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 (Kelly & Buckland 2005).

The research process involved assessing data availability for construction of social 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 Catchment Management Authorities (CMAs) can use in their decision-making processes. In this paper we report the results of this project in the current context of natural resource management (NRM) decision making processes in New South Wales (NSW).

2. Natural Resource Management monitoring and evaluation processes

The CMAs in NSW are regional bodies that work in partnership with farmers, local groups, Aboriginal communities, local government, industry and State Government agencies to develop the best policies and programs for natural resource management at a catchment level. The CMAs are developing Catchment Action Plans (CAPs) which will guide the management of soil, native vegetation and water resources over a 10-year period.

The Natural Resources Commission (NRC) in NSW has recommended a suite of targets for NRM to the NSW Government. It also recommended a number of indicators to help measure progress against resource condition targets (see <http://www.nrc.nsw.gov.au/>). The state-wide targets will focus state-wide NRM investments and provide a means of tracking progress on NRM issues within NSW. Their overall purpose is to ensure that natural resources continue to support the community’s environmental, economic and social/cultural values in the long term.

Two of the NRC’s targets relate to socio-economic targets:

- Target 12: Natural resource decisions contribute to improving or maintaining economic sustainability and social wellbeing; and
- Target 13: An increased capacity of natural resource managers to contribute to regionally relevant natural resource management.

The intent of Target 12 is not to measure the success of NRM against overall health and wellbeing of communities, since so many other factors influence these outcomes. However, it will ensure that NRM makes a positive contribution to these outcomes. There are no timeframes specified in either of these Community Targets as they both have immediate and ongoing priorities.

In addition, the NRC document states that there are overarching requirements for socio-economic assessment integrated within the components of the standard. The components of the standard specify mandatory outcomes, including:

- That the best available knowledge (including bio-physical, socio-economic and cultural) is used to inform decisions;
- A focus on the relevant scale to measure appropriate trade-offs between social, economic, environmental and cultural outcomes;
- Collaboration with other parties to maximise gains, share or minimise costs or deliver multiple benefits;
- Meaningful engagement of the community;
- Management of risks to maximise efficiency and effectiveness and to control adverse impacts;
- Quantification and demonstration of progress towards targets by measuring, monitoring, evaluating and reporting so that practices are improved; and
- Management of scientific, economic, social and cultural information to satisfy formal security, accountability and transparency requirements.

While not prescriptive, these components of the standard are required to be used variably in all aspects and stages of NRM. Consequently, while the mandatory outcomes of the standard are particularly relevant to Targets 12 and 13, it is important to recognise that socio-economic considerations will play a part in CMA decision making processes about how they pursue all of the state-wide targets.

The project reported here relates to meaningful engagement of the community in NRM decision making. It develops understanding of the social context of land-use change in a case study – the Boorowa catchment. The paper reports some lessons for measuring and managing the social implications of changes in rural land use.

3. Catalysts of change in Boorowa

Wool production has been a major influence over the development of land within the Boorowa district. Traditional wool-growing based on native and improved pastures has underpinned the agricultural industries within the district, and the economic and social wellbeing of the district has traditionally been based on wool.

3.1 Declining terms of trade in agriculture

There continues to be a pronounced decline in the terms of trade in agriculture for farmers, particularly those involved in wool production (Fisher 2005). This decline in viability of wool production has had a major impact on families' prosperity and rural land-use (Gray & Lawrence 2001).

3.2 Severe drought

The drought that affected inland NSW up to mid-2005 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).

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.

3.3 Land prices unrelated to income

The value of rural land in the south-east of the Boorowa district has risen 3 to 5 times its perceived commercial farming value – with land purchased by people who want small rural properties (4-80 ha) and don't identify themselves as farmers. The influence of Canberra, a major population and employment centre located about 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 less likely to be dependent on agriculture than their quality of life.

At a superficial level, the 'agriculture' landscape (i.e. the appearance of viable agricultural enterprises) can mask the socio-economic and demographic changes 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 are not 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 & 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 is likely to have constrained changes towards recommended NRM.

4. Socio-economic profile of landholders in the Boorowa catchment

Existing data can be used to create a socio-economic profile of key stakeholders which can provide an improved understanding of the prevailing socio-economic context. For example, existing data can create a profile of landholders by giving an indication of the importance of farming for household income, major enterprises and land-use, extent that land values reflect agronomic potential, and rate of property turnover. Information on these aspects of farm management can have important implications for the strategies used by CMAs and other agencies.

4.1 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 (Australian Bureau of Statistics (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.* 2005) – the same median age recorded in 2001 of farmers across Australia (ABS 2003).

4.1.1 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’ (i.e. their primary occupation), working a median of 60 hours per week (Byron *et al.* 2005, p.44). Also, only 50% of landholders reported a profit from their farm business, whilst 76% reported a profit from off-farm sources (Byron *et al.* 2005).

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.* 2005, 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 showed that 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).

4.1.2 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 of the commercial farmers and part-time/lifestyle landholders reported that having a diverse mix of enterprises (diverse income sources) has been vital to surviving on the land, particularly over recent years with declining 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. For example, 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 their recent survey of landholders in the ‘Lachlan slopes’ area, including the Boorowa LGA, the median size of rural properties was 114 hectares (Byron *et al.* 2005). By combining property size with the typical agronomic potential of the district (DSE 5.6 per hectare, NSW Department of Lands 2005) and the gross margin for a fine wool enterprise (\$10.4 per DSE, NSW Department of Primary Industries 2005), the business would generate a total farm gross margin in the order of \$6,640 – well below the \$50,000 p.a. needed to allow re-investment in the natural assets of a property (FM500 2005). Families with an average-sized grazing property in the Boorowa district must 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 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.* 2000). Given the low level of income from an averaged-sized grazing property in the Boorowa district, this would suggest many landholders may be unwilling or unlikely to invest in 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 2005), 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 (see Table 1). Given there has not been any comparable increase in the value of wool, and none anticipated in the next 5 years (Australian Bureau of Agricultural and Resource Economics (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.

Although 22% of respondents in the ‘Lachlan slopes’ reported plants on their property showing signs of salinity, Byron *et al.* (2005) 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). 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.

4.1.3 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 commodity enterprises, while investing in activities to secure the environmental qualities of their properties. Non-commercial lifestyle landholders mirror this situation, yet 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/map (eg. whole farm plan) correlates to landholders undertaking environmental works. However, some landholders interviewed, mainly part-time/lifestyle landholders, reported 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.

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 Department of Infrastructure Planning and Natural Resources (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 due and an uneconomic distance to the nearest mill. The returns from farm forestry were assessed to be significantly below the returns from cropping or livestock, which forestry would replace. Other land-use options were assessed between the 'liming' (best option) and 'forestry' (worst option) option (see Table 2).

4.2 The future for Boorowa landholders

Factors that influence perceptions of the future, for individual properties 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 during this research 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 factors (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.

4.2.1 Property turnover

Byron *et al.* (2005) found that in the ‘Lachlan slopes’, 34% of respondents were anticipating to sell their property and 35% were anticipating expanding their property in the long-term. Also, Byron *et al.* (2005) 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.* 2005).

4.3 ‘Preferred futures’ of Boorowa landholders

4.3.1 Workshop approach

Two workshops were held in July 2006 to understand the views of a wide range of landholders in the Boorowa district regarding:

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

The workshops were designed to be small in size (5-7 participants) to maximize the opportunity for group discussion. Workshop participants were broadly characterised into two groups – people not fully dependent on agriculture for their household income (Group A), and people highly dependent on agriculture for their household income (Group B).

The goals expressed by Group A for their properties in 10-12 years included:

- Attaining or improving efficient water allocation and use – allowing more intensive farming so smaller properties become financially viable;
- Generate sufficient income to support livelihood;
- Improve farm management b further subdivision of paddocks; and
- Plant more trees and shrubs to increase bird life (e.g. around m large dam to create a sanctuary), control erosion around the creek, and to control salinity and weeds.

The goals expressed by Group B for their properties in 10-12 years included:

- Create a property that is aesthetic, healthier (e.g. 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 (e.g. go on a holiday, have more time, farm without the intense financial pressures and 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 and meat production);
- Have better water supplies; and
- Be paid for the public good benefits generated on farms.

Both groups wanted to improve their landholdings – Group A to support their livelihood and for improved environmental outcomes, and Group B to become more productive and have a better lifestyle.

4.4 Linking salinity mitigation with landholder aspirations

The results from this research are useful in understanding the current and future management of farmland in the Boorowa district, in terms of property management, reliance on farming for household income, willingness to invest in NRM activities that may take some years to generate benefits, and the relationship and communication between landholders and agencies.

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

- 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.

5. Indicators of the social dimension of land use

5.1 Social landscapes

The Australian environment is invariably characterized by its native vegetation, land forms, fauna 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 (e.g. 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 CMAs and NRM-related agencies have a relatively 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 (see Box 1).

5.2 Indicators of social processes employed by CMAs

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 CMAs. 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 CMAs have, or will have, social processes that have:

- identified the cross-section stakeholders in the NRM region (eg. people, groups, organizations and industries);
- understood the issues, capacities and aspirations of the different stakeholders;
- designed a process to meaningfully engage stakeholders in NRM;
- addressed the constraints faced by different stakeholders to changing practices to improve NRM;
- empowered stakeholders to have increased knowledge, be better skilled, and greater confidence to undertake improved NRM;

- fostered stronger mutually-beneficial partnerships between different stakeholders; and
- improved NRM which leads to and supports aspirations of all stakeholders.

Box 1: 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 is often linked with improved NRM.

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;

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 organizations and attracted additional resources;

Confidence and trust - extent people have confidence and trust in agency staff and organizations (e.g. shared understanding of critical issues and strategies for improved NRM) (Race & Curtis 2005)

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*’ (see Box 2), which requires 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. Some possible indicators and examples of targets for Target 12 are included in Box 2 below.

5.3 Indicators of landholders’ capacity and willingness to change land-use

Even when landholders are engaged in social processes facilitated by CMAs 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 Charles Sturt University (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 dependence and level of household income on agriculture, and long-term plans, have a strong correlation with the capacity and willingness to undertake particular types of land-use change.

Landholders with a low dependence on agriculture for household income (e.g. 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).

Box 2: Indicators of NRC Target 12

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 (*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 documents (*Example target: Relevant economic, social and geographical research undertaken every 5 years that show the costs and benefits associated with NRM*);

Extent partnerships have formed between different individuals, groups and organisations relevant to NRM (*Example targets: High proportion of stakeholders are actively involved in mutual planning for a and implementation activities; High proportion of the community involved in groups with goods 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*).

Landholders with a high dependence on agriculture for household income are unlikely to be able to incur the:

- financial costs of new practices (even if reimbursement is offered),
- risks of failure (e.g. 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.

6. Applying the framework – a suggested methodology

A cost-efficient and effective methodology is needed for CMAs 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, CMAs 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. However, as with other disciplines of science it may be more efficient for regional NRM organisations to link with, or commission, specialist expertise of qualified social scientists.

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.

6.1 Collecting relevant data

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. Given the wide range of methods that can be used with rural communities to collect and analyse data, (Coakes 1999; Aslin & Brown 2002), the methods in the approach followed below should be viewed as suggestions 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).

6.1.1 Data analysis

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 are unlikely to answer specific questions posed by CMAs, they 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 profile of landholders by giving an indication of the importance of farming for household income, major enterprises and land-use, extent land values reflect agronomic potential, and rate of property turnover. Information on these aspects of farm management can have important implications for the strategies used by CMAs and other agencies.

6.1.2 Workshops

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.

6.1.3 Interviews

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.

6.1.4 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 aspirations of the target audience. For example, there is little value promoting the benefits of intensive 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 may be informative, and match the aspirations of the target audience and appear achievable.

7. Conclusion

This paper reports research which explored the social dimension of rural life in the context of land-use change for improved NRM at the catchment scale. A case study for the Boorowa catchment is presented. The focus of the paper is on how social research methods can contribute to CMA decision making processes in meeting the NRC Target 12 requirement – to make NRM decisions that contribute to improving or maintaining economic sustainability and social wellbeing.

Three general components of analysis are presented – developing a socio-economic profile of the catchment, developing a socio-economic profile of landholders in the catchment, and developing indicators of the social and economic dimensions of land

use. The catchment profile can be developed from analysis of existing data and undertaking further research,. Development of a socio-economic profile of landholders can be undertaken with a combination of approaches – using existing data on social and demographic characteristics, and conducting workshops with stakeholders. Indicators of the social dimensions of land-use can also be developed using existing research results and stakeholder analysis to develop indicators of landholder capability and willingness to invest in specific NRM strategies. As part of the analysis of the Boorowa district, a number of indicators of social processes relevant to Target 12 are presented.

Monitoring and evaluation of progress towards social and economic targets within a catchment can also be developed with data collection and analysis, by holding workshops with experienced people, by conducting interviews with a cross-section of the community, and by analyzing relevant case studies.

It must 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. 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. If this is the case, effort should be made to link with, or commission, the specialist services of qualified and experienced social scientists.

The research reported in this paper also revealed important differences between the aspirations of many landholders and their capacity to invest in NRM works. For instance, 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. In contrast they are more interested in other types of NRM associated with the aesthetic characteristics of their properties. These findings appear to have important implications for how CMAs engage with landholders and provide support programs.

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

1. Provide the materials for NRM works undertaken by farmers (rather than a financial rebate);
2. Focus on NRM options that improve farm biodiversity and aesthetics for non-farming landholders (e.g. offer ecological and landscape design support); and
3. Invest in activities that build ‘social capital’ amongst landholders and the wider community, particularly during drought when less on-ground works may be undertaken.

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Table 1. Typical property size, productivity and land value in Boorowa LGA, NSW

Locality	Farm area (Ha)	Carrying capacity	1996 land value	2005 land value	Farm income
Boorowa	302	1,700	\$240,000	\$546,000	\$17,000

Source: NSW DPI (2005) and NSW Lands (2006).

Table 2. 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).