Riverina Local Land Services natural resource management activities

Evaluation of socio-economic benefits and costs

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Dr Jacki Schirmer

Health Research Institute & Institute for Applied Ecology, University of Canberra

jacki.schirmer@canberra.edu.au

UNIVERSITY OF CANBERRA | HEALTH RESEARCH INSTITUTE

UNIVERSITY OF CANBERRA | INSTITUTE FOR APPLIED ECOLOGY

Executive summary

Introduction

Natural resource managers are increasingly asked to assess not only the environmental outcomes of their investments in improving land management and environmental health, but also the social and economic outcomes. The 'wellbeing pathways' approach examines social and economic outcomes by examining the effects of engaging in natural resource management (NRM) activities on social and economic 'pathways' known to influence wellbeing. Wellbeing here means the ability of a person to realise their potential, cope with normal challenges, and contribute to their community. Many factors contribute to a person's overall wellbeing, including their safety and security, their physical and mental health, their relationships and social networks, their access to goods and services, and the fairness of the society they live in.

Riverina Local Land Services commissioned the University of Canberra to develop measures for assessing the social and economic effects of their NRM investments, using a wellbeing pathways framework. This assessment examined landholders who had engaged in NRM activities, with a particular focus on those who had entered into agreements to (i) protect, maintain and enhance vegetation on their land (vegetation agreements); (ii) change how grazing is managed in order to improve groundcover (grazing agreements) or (iii) establish stock management areas that can assist in maintaining groundcover during periods of low rainfall (stock management area agreements). Participation in NRM workshops and in receiving advice were also examined.

The 'wellbeing pathways' framework

Wellbeing is often measured by asking people to rate their level of satisfaction with different aspects of their life. Measuring overall wellbeing, however, is of limited use in assessing the effect of engaging in NRM activities, as NRM activities will be only one amongst many factors influencing a person's wellbeing. To address this, a 'wellbeing pathways' framework was identified, in which a number of measures were designed to assess the extent to which engaging in NRM had changed a number of factors (pathways) known to influence wellbeing. The key wellbeing pathways identified as being likely to be impacted by engaging in an NRM activity were a person's:

- Standard of living (e.g. financial wellbeing)
- Self-efficacy (a person's confidence in their ability to achieve desired outcomes in life; for landholders this typically includes achieving a range of land management objectives even in challenging times such as drought)
- Identity (the self-concept a person has of what it means to be a good person who is fulfilling their role, for example an identity as a good steward of the land)
- Social capital (a person's social networks which enable them to access support and resources from others, for example advice and assistance from other farmers)
- Health (mental and physical health are central to a person's wellbeing).

To assess the effects of engaging in NRM on a landholder's social and economic wellbeing, landholders were asked to:

- Rate their overall satisfaction with the NRM activity, providing an overall assessment of the direction and type of effect on wellbeing
- Rate the extent to which they experienced change in several aspects of their lives as a consequence of engaging in the NRM activity; each of these aspects were factors that impacted on either their standard of living, self-efficacy, identity, social capital and/or health
- Report their overall wellbeing using wellbeing measures.

Methods

A survey questionnaire was designed, reviewed by Riverina Local Land Services staff, and piloted by a mixed of landholders and NRM professionals. A total of 401 landholders were identified who had engaged in an agreement with Riverina Local Land Services since 2012, and this formed the sample frame. The survey was delivered using both mail and online survey forms, with landholders contacted a total of four times about the survey by mail or email (and in some cases both). In total, 113 valid survey responses were received, with an overall response rate of 29.9% after removing a small number of landholders from the sample frame who were not eligible to complete the survey.

Landholder characteristics

All those who responded to the survey managed their land for commercial farming. The majority engaged in either mixed cropping and grazing (49%) or grazing enterprises (51% including sheep and beef graziers). Just over half (52%) had spent 30 years or more in farming, but only 30% had managed their current property or properties for more than 30 years, and 19% had managed their current property/ies for less than five years. Farm economic size varied substantially. A majority (59%) had no off-farm work, while 18% worked part-time off farm and 23% worked full time off farm. Most (78%) of survey respondents were male, and the majority were aged 50 or older (62%). Almost half (46%) had a university degree. Most were highly satisfied with most aspects of their life, with ratings of 80 or more out of a possible 100 for most measures of wellbeing.

NRM activities

The most common types of NRM activity survey participants had engaged in were entering an agreement to either protect existing vegetation, plant or seed new vegetation, or encourage regeneration of vegetation (85%), followed by receiving one-to-one advice from a Local Land Services or Landcare staff member (62%). Fewer had attended a paddock walk or paddock demonstration (37%), attended a workshop or training course (33%), attended an NRM or Landcare social event (32%), received a Landcare grant (30%), entered a grazing management agreement (30%), received a grant from Riverina Local Land Services (other than entering a formal agreement) (28%), entered into an agreement to establish a stock management area (25%), or attended a Landcare nature walk (21%).

Of the respondents, 35% had engaged in one or two NRM activities in the last five years; 34% had engaged in three to five activities; and 31% had engaged in six or more NRM activities.

Satisfaction with NRM agreements

Landholders who had entered an agreement with Riverina Local Land Services were asked (i) the types of activities involved in the agreement, and (ii) how satisfied they were with the work done and the outcomes of the agreement. A total of 98 landholders who had participated in agreements answered

this part of the survey, for a total of 142 agreements they had entered. Overall the large majority of landholders reported being satisfied with the work done and outcomes of agreements they had entered into with Riverina Local Land Services, irrespective of the specific nature of the agreement. The 'average' (mean) satisfaction score across all agreements was 5.3 out of a possible 7 (rated from 1 = not at all satisfied to 7 = very satisfied). When the specific activities undertaken as part of the agreement were examined (for example, establishing a stock management area, fencing a riparian area, subdividing a paddock and changing grazing management), satisfaction remained high for all types of activity.

The 48 landholders who had attended a total of 90 workshops were also very satisfied with these workshops: when asked to rate satisfaction from 1 (not at all satisfied) to 7 (very satisfied), almost all landholders who had attended workshops or training courses rated their satisfaction as '6' or '7' (85%). Very similar satisfaction levels were reported with most types of workshop, with a high average satisfaction rating for workshops involving use of technology, stubble management, crop nutrition, plant identification, soil health, remnant bush monitoring, pest animal control, threatened species, and animal health. Slightly lower average satisfaction was reported with workshops examining weed management/noxious weeds, and farmer health and wellbeing.

Similarly, most landholders who had received advice from a Local Land Services staff member (67 landholders in total) reported being very satisfied with advice received, with most (82%) rating the advice '6' or '7' on a scale from 1 (not at all satisfied) to 7 (very satisfied). Similarly high levels of satisfaction were reported for most types of advice, with the exception of advice on completing grant applications, where satisfaction was lower for the small number of landholders who had received this type of advice. Overall, landholders were more likely to report high levels of satisfaction with advice received by phone or email, and slightly lower satisfaction with advice received in person, although differences were small.

These satisfaction ratings confirm that the overall impact of NRM activities on wellbeing is likely to be positive in almost all cases. However, data on overall satisfaction, while giving a picture of overall likely direction of effect (i.e. a positive effect on wellbeing), does not indicate by what pathways the NRM activities may be influencing wellbeing, or how strongly.

Effects of participating in NRM agreements on key wellbeing pathways

Landholders were asked to nominate up to two NRM activities they had engaged in which they wished to evaluate in more detail in the survey. Of 96 landholders who nominated one or two activities, the large majority – 86 – nominated agreements with Riverina Local Land Services as the activities they wished to assess. These 86 landholders provided assessment of a total of 115 agreements they had entered into, with 29 evaluating two agreements and 57 evaluating one agreement. Of the 115 agreements, 13 were grazing agreements, 14 were stock management area agreements, and the majority – 88 – were vegetation agreements. Landholders were first asked to describe their views about positive and negative effects of these agreements, and then to rate their effects on different wellbeing pathways.

Of the 13 landholders who provided written comments on their grazing agreements, twice as many provided comments about positive outcomes as identified negative outcomes. The most common comments were that the agreement had positive impacts in the form of reduced grazing pressure, increased pasture health, improved vegetation health and regeneration, and improving targeted grazing

management, while some also reported negative impacts in the form of high costs to the landholders, and difficulty of fencing challenging terrain.

Of the 13 landholders who provided written comments on their stock management area agreements, most provided comments about positive outcomes and very few about negative outcomes. The most common comments were that the agreement had positive impacts in the form of (i) improved health and maintenance of groundcover, and (ii) improved capacity to cope with periods of low rainfall and drought, as well as improving stocking options and overall productivity. Two landholders reported negative impacts on their labour time.

Of the 73 landholders who provided written comments on their vegetation agreements, just over twice as many commented on positive outcomes as commented on negative outcomes or suggested changes. The most common comments were that the agreement had positive impacts in the form of (i) increased health, diversity and amount of vegetation, (ii) reduced erosion, usually in riparian areas; or (iii) making grazing management easier. Some reported negative impacts on their labour time, and in the form of higher than anticipated financial costs. Suggestions for improvement included increasing the flexibility and timeframe of project implementation, helping address issues such as needing to plant in unseasonal conditions, and improving weed and pest control and the quality and type of materials used.

Quantitative evaluation of effects of NRM agreements on pathways to socio-economic wellbeing

Agreement holders were asked whether the agreements they had entered with Riverina Local Land Services had led to any of a number of social or economic changes, specifically on their workload, farm profitability, farm productivity, land management cost, complexity of land management, stress levels, sense of achievement/pride, sense of frustration/worry, ability to cope with drought or other challenges on the land, health of their land, their land management knowledge and skills, their social interactions, or their physical health.

A majority of the 13 landholders who had entered grazing agreements felt the agreement had improved the health of their land, made them feel a sense of achievement or pride, made them feel better prepared for challenges on their land, made it easier to manage their land, increased overall farm productivity, and increased land management knowledge or skills. This suggests that the primary way grazing agreements impact on socio-economic wellbeing is via the pathway of identity and self-efficacy, with farmers feeling better able to achieve land management and stewardship goals. It also suggests some potential effects on financial wellbeing (via farm productivity) and mental health (via increase ease of land management, better confidence in being able to cope with challenges, and the improvements on self-efficacy and identity). When asked more directly about the effect of the grazing agreement on key wellbeing areas, this was confirmed to a large extent: the majority of landholders who had entered grazing agreements (85%) felt it had a positive impact on their ability to achieve desired outcomes on the land, and on their life as a whole, while most reported a positive impact on their sense of future security. There were, however, a range of views about impacts on finances, with five reporting a negative impact, five a positive impact and three a neutral impact.

A majority of the 13 landholders who evaluated stock management agreements felt the agreement had improved their ability to cope with drought, made them feel better prepared for challenges on their land, made them feel a sense of achievement or pride, made it easier to manage their land, increased overall farm productivity, and improved the health of their land. This suggests that the major pathways

by which entering a stock management agreement is likely to impact on farmer wellbeing is via improving self-efficacy and identity, and in some cases through improving standard of living. Many may also experience improved mental health via reduced stress, reduced land management complexity, and improved self-efficacy. This was supported by analysis of questions which asked more directly about the ultimate effects on each wellbeing pathway: landholders were most likely to report positive effects on improved future security and improved ability to achieve the things they wanted to on their land, were somewhat more likely to report positive than negative impacts on their finances, and mostly reported neutral or positive overall effects on their life.

A majority of the 82 landholders who provided detailed evaluation of the social and economic effects of entering into a vegetation agreement reported positive effects on the health of their land, and on their own sense of achievement or pride, while 51% also reported they increased their land management knowledge or skills a lot, and 49% reported finding it easier to manage their land. A substantial proportion – 40% - reported a large increase in their workload. This indicates somewhat different wellbeing pathways are triggered by vegetation agreements compared to grazing and stock management area agreements: in this case, the main pathways are reinforcing farmer identity through achieving stewardship objectives and pride, and increasing self-efficacy through increasing knowledge and skills. This type of agreement is less likely to make landholders feel better prepared for challenges on their land, or to improve farm productivity. This was confirmed in analysis of the direct effects on each wellbeing pathway: 73% of those with vegetation agreements reported a positive effect on their ability to achieve the things they wanted to on their land, and 46% a positive effect on their life as a whole, while none reported a negative impact. Around one third reported improved social connections, relationships, health, or finances, and one quarter reported worse finances as a result of the agreement.

Variation in experiences of different landholders

Different types of landholders were compared to identify whether they were more or less likely to report that the NRM agreement they had participated in was neutral or positive for their life overall. There was little variation in views by farmers managing farms of different economic size, but sheep graziers, and to a lesser extent beef graziers, were more likely to report the NRM activity had a positive effect on their life overall than those running mixed grazing and cropping enterprises, or those running mixed grazing enterprises. This suggests a need to better understand how NRM agreements impact complexity of farm management for those who run mixed enterprises versus those who focus on grazing a single type of animal. Landholders who had engaged in more NRM activities were more likely to report positive outcomes from any one of those activities. There was no difference in reported impacts amongst landholders with no off-farm work, part-time or full-time off-farm work. Farmers who had been farming for fewer years were more likely to report positive impacts than those who had been farming for more years. Women reported slightly more positive effects than men, there were no differences by age (indicating that the differences observed between those who had spent differing time in farming were related to farming skills and knowledge, rather than to age), and there were very few differences amongst landholders with differing levels of formal educational attainment.

Overall wellbeing of landholders

The final step in our analysis was examining the overall wellbeing of landholders, and identifying whether the effects of NRM activities on wellbeing is visible when the overall wellbeing of landholders who have engaged in agreements is examined. The overall wellbeing reported by landholders who had

engaged in NRM analysed by (i) comparing wellbeing of those who said the NRM activity had *neutral* versus *positive* overall effects on their life; and (ii) comparing wellbeing of those who had engaged in NRM to the average wellbeing of Riverina farmers more generally, using data from the 2016 Regional Wellbeing Survey.

There was is a strong difference in overall wellbeing reported by landholder who (i) reported the NRM agreement had a *neutral* effect on their life and (ii) that it had a *positive* effect on their life overall. Those who reported that entering an NRM agreement had a neutral effect on their life overall typically reported wellbeing similar to or slightly higher than that of Riverina landholders as a whole, with one exception: they reported poorer standard of living than other Riverina landholders.

Those who reported that entering an NRM agreement had a positive effect on their life overall had wellbeing that was moderately higher than that of the average Riverina landholder for their (i) life as a whole, (ii) personal relationships, (iii) feeling part of their community and (iv) their future security. Their wellbeing was significantly higher than the average Riverina landholder for (i) health, (ii) what landholders were currently achieving in life, and (iii) feeling safe. This is consistent with the wellbeing pathways identified in earlier analysis: NRM agreements most commonly had positive impacts on self-efficacy (via improving ability of landholders to achieve desired outcomes on the farm and cope with challenges), and on mental health via both the improvement in self-efficacy and through reinforcing farmer identity in the form of feeling a sense of achievement or pride.

Overall, these results suggest that the wellbeing pathways activated by engaging in NRM agreements are, for those landholders who report a positive impact of the NRM activity on their life overall, observable as a significantly higher level of overall wellbeing, particularly in the critical areas of mental health and self-efficacy.

Conclusions

The findings of this project show that engaging in NRM activities with Riverina Local Land Services has a positive effect on the wellbeing of most of the landholders involved. Importantly, it is very rare for landholders to report negative effects on any aspect of wellbeing, with the one exception being their finances, where a significant minority of landholders report some negative impacts. Of landholders who have entered into agreements, around half experience an overall improvement in wellbeing that is observable and significant, while the other half maintain their wellbeing overall. Engaging in NRM agreements typically had effects on wellbeing via the wellbeing pathways of (i) improving self-efficacy, (ii) improving health, and (iii) supporting the identity of farmers (which is strongly associated with both mental health and self-efficacy).

The results have some limitations: in a cross-sectional survey, causal pathways cannot be formally determined. In future, an improved approach would involve Local Land Services staff asking landholders to complete a short survey when they are applying for funding or just entering into an agreement, which would include a baseline measure of wellbeing and each of the key wellbeing pathways. This survey could then be repeated after works are completed and over time as the landholders see outcomes from the NRM activities. This would provide longitudinal data able to be analysed to provide more robust evidence on causal pathways, using the same approach demonstrated in this report.

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Figures and Tables

1. Introduction

Natural resource managers are increasingly asked to assess not only the environmental outcomes of their investments in improving land management and environmental health, but also the social and economic outcomes. It is important to understand the social and economic outcomes of natural resource management (NRM) investments for a number of reasons. First, social and economic outcomes form part of the 'triple bottom line' of sustainability, and assessing the outcomes of NRM work therefore requires understanding whether it achieved positive change, negative change, or no change at all to environmental, social and economic conditions. Second, NRM activities often rely on voluntary action: community volunteers, rural landholders, farmers and others are asked to enter into agreements, apply for grants, or take part in activities. These voluntary actions are more likely to occur if the NRM activity is likely to have positive social and economic outcomes – or if they at least have no significant negative social or economic implications.

While it is increasingly recognised that evaluating social and economic outcomes of NRM investments is important, it is often challenging to do this type of evaluation. The challenges include (i) identifying which social and economic outcomes to measure, (ii) identifying how to robustly measure these outcomes and, perhaps most importantly, (iii) identifying the extent to which the NRM investment versus other factors contributed to the outcome being measured.

For example, an NRM organisation may offer a grant to landholders to assist them in investing in reorganising fencing and grazing management in order to improve groundcover. Monitoring the environmental outcomes of the grant requires identifying if groundcover increases, and to what extent (and with what species). Monitoring the social and economic outcomes requires identifying what types of social and economic outcomes could potentially result from changing grazing regimes. These might include changes in (i) input costs (for example, improving groundcover may reduce fodder needs by better providing pasture for stock to graze on year-round, or alternatively might increase fodder costs if the groundcover increase is achieved in part by increased reliance in purchasing feed for stock), (ii) labour time and costs (labour required to manage stock may decrease or increase), (iii) revenue (depending on effects on achieving good stock growth and lamb/calf survival rates, amongst others), (iv) landholder stress (which may reduce or increase depending on whether the change makes farm management easier or harder), and (v) landholder accomplishment/pride (sense of being able to achieve positive outcomes on the land and fulfil desired land management objectives). However, other factors may also affect input costs (for example, rising prices), labour time (a challenging period of drought or excessive rain, for example, or rising wage rates for farmhands), revenue (commodity prices for lamb, wool or beef), landholder stress and accomplishment/pride (affected by things such as personal relationships as well as all other aspects of land management). Any assessment of the effects of the NRM investment therefore needs to clearly identify if an improvement (or decline) in input costs, labour costs, revenue, stress, or pride/ accomplishment resulted from the NRM investment, or from other unrelated factors.

One way of addressing this complexity is to use an assessment approach in which participants are asked to assess the effects of the NRM activity on different areas of their life, with the assessment focusing on known 'pathways' to economic and social outcomes. These are also called 'wellbeing pathways': in other

words, if there is a change in one of these factors, it is likely to make a difference to a person's overall level of wellbeing, or quality of life. When discussed with individual people, wellbeing means:

> *a state … in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.* (World Health Organization, 2013)

Many factors contribute to a person's overall wellbeing, including their safety and security, their physical and mental health, their relationships and social networks, their access to goods and services, and the fairness of the society they live in (see Wilkinson and Marmot 2003 for more examples).

Since the Millennium Ecosystem Assessment, there has been growing interest in understanding how changes in natural resource management affect human wellbeing, with multiple assessment frameworks produced (Millennium Ecosystem Assessment 2005, Yang et al. 2013, Argawala et al. 2014). Wellbeing is a useful framework to use to assess social and economic outcomes, as it integrates social and economic effects, and there is a large body of evidence on the factors that influence a person's wellbeing.

Riverina Local Land Services commissioned the University of Canberra to develop measures for assessing the social and economic effects of their NRM investments, using a wellbeing framework. Riverina Local Land Services engages in delivering a wide range of NRM activities to landholders and other groups in the Riverina region of New South Wales. The scope of the project involved examining the effects of investments delivered to landholders, as this represents a large proportion of the NRM activities of Riverina Local Land Services. Riverina Local Land Services delivers a wide range of NRM activities to landholders. These include:

- **Vegetation agreements:** Entering agreements with landholders to protect, maintain and enhance vegetation on their land, for the purposes of conserving and increasing vegetation in communities of high conservation value, providing habitat, and/or reducing erosion into waterways, amongst others. These agreements involve provision of funding to the landholder who agrees to undertake works within a specified timeframe and then to maintain the site for an agreed number of years (usually 10 years). The landholder often contributes labour time and some costs of materials such as fencing. The actions taken can include fencing areas, planting seedlings, sowing seed, and excluding grazing to enable regeneration of vegetation, amongst others.
- **Grazing agreements:** Agreements with landholders to change how grazing is managed in order to improve groundcover. For example, the agreement may be to subdivide some paddocks and improve watering points, enabling better targeting of grazing to different land types on a property and enabling longer recovery times between periods of grazing in each subdivided area. Activities often include fencing to land type, and installation of watering points.
- **Stock management area agreements:** Agreements with landholders in which the landholder is provided funds to assist them in establishing a stock management area (also sometimes termed a drought lot or confinement feeding area), which can be used in times of low rainfall. These areas provide a place to manage stock and feed them, and reduce loss of groundcover during low rainfall periods.

- **Water use efficiency agreements:** Agreements to undertake work to increase water use efficiency, for example through investments in improving on-farm water infrastructure.
- **Workshops/training courses:** Workshops are delivered on a wide range of topics by Riverina Local Land Services, ranging from grazing management, stubble management, animal health, soil health and crop nutrition to plant identification, threatened species, weed and pest management, use of technology, cultural values and farmer health and wellbeing. These workshops provide landholders with knowledge, skills and ideas to support them in engaging in NRM activities.
- **Advice:** Local Land Services staff provide advice to landholders on aspects of the NRM activities. This advice can be on a wide range of topics, and may be delivered in person, on the phone, or by email.

Riverina Local Land Services also partners with a wide range of organisations to deliver multiple projects in addition to those listed above: for example, the Bitterns in Rice project is a partnership between multiple organisations including Riverina Local Land Services that is engaging many rice farmers in identifying and tracking Australasian Bitterns, identifying bittern friendly rice growing practices, and contributing to conservation of this rare bird.

The diversity of NRM activities engaged in by Riverina Local Land Services reflects the importance of creating unique projects suited to local needs. It does also present challenges for assessing the social and economic effects of investments in NRM, as projects involving different types of activity may have quite varying effects on the social and economic wellbeing of the landholders involved.

As agreements with landholders, workshops, and advice are three core areas of NRM activity for Riverina Local Land Services, with agreements forming a large part of this investment, a decision was made to prioritise assessing the effects of agreements, while also seeking information where possible on views of landholders about other NRM activities they have engaged in. A decision was also made to focus on understanding the effects on landholders, rather than attempting to then quantify the flow-on effect to the broader community.

The mechanism used to assess social and economic outcomes for landholders of engaging in NRM activities was a survey of landholders who had engaged in NRM activity. This report is structured in the following sections:

- The wellbeing framework used to assess socio-economic outcomes of investment in NRM activities is explained, including a brief review of key literature that was drawn on to develop the approach used
- The methods section explains how data were collected and analysed via the survey of landholders
- The results are presented in several sections, examining:
    - Landholder characteristics
    - The types of NRM activities surveyed landholders had engaged in
    - Satisfaction of landholders with the NRM activities they have been involved in
    - Detailed evaluation of whether engaging in agreement has led to measurable changes in overall social and economic wellbeing of landholders via different ‘wellbeing pathways’
- Discussion and conclusions.

2. Understanding the socio-economic effects of NRM investment: the 'wellbeing pathways' framework

2.1 Challenges of assessing effects of NRM investment on social and economic wellbeing

This section of the report describes the 'wellbeing pathways' framework used to analyse the socio-economic effects of investments in NRM made by Riverina Local Land Services.

While there is growing interest in assessing the social and economic effects of investments in NRM, on-ground work remains limited due to some of the challenges inherent in this type of work. In particular, these challenges include that (see for example Schirmer 2011, Schirmer et al. 2013):

- A person's social and economic wellbeing is influenced by multiples factors occurring in their life, of which engaging in an NRM activity will be only one. This means that attempting to simply correlate a person's overall wellbeing with their level of engagement in NRM is unlikely to identify any meaningful results, as the other factors influencing a person's wellbeing are likely to 'drown out' the effects of NRM. Therefore any approach to assessing the social and economic effects of NRM needs to clearly identify how to assess the effects of NRM relative to other factors.
- Social and economic wellbeing is multifaceted. There is no one measure of wellbeing, with wellbeing made up of a complex mix of factors influencing a person's access to social connections, financial resources, safety and security, the ability to achieve desired outcomes in life, good health and positive personal relationships. This means social and economic assessment of NRM needs to clearly identify the aspects of wellbeing that are to be assessed, and in particular the areas of wellbeing NRM activities may influence.

Overcoming these two key challenges requires an assessment approach that identifies the extent to which engaging in NRM has a positive or negative effect on different areas of a landholder's life known to influence wellbeing. This then enables identification of the nature and type of socio-economic effects of NRM, while acknowledging that other factors than the NRM activity are likely to be having a significant impact on wellbeing.

To achieve this framework requires identifying:

- Wellbeing
- Key 'wellbeing pathways' of relevance to NRM: in other words, the ways in which NRM activities are most likely to influence wellbeing
- A framework for bringing this together to identify how NRM activities influence social and economic wellbeing of the landholders who engage in these activities.

Each of these is examined in turn in the next sections.

2.2 Defining social and economic wellbeing

The term 'wellbeing' is used to mean many things, and can be relatively unclear. In this report, it is defined, as described previously, as meaning a person has the ability to achieve their potential, cope with normal challenges, and contribute to society. This, however, can still seem quite broad, and challenging to measure. In recent decades, two related approaches to measuring a person's overall

wellbeing have emerged, which are often labelled the 'objective' and 'subjective' approaches to wellbeing.

Objective approaches to measuring wellbeing measures aspects of a person's life considered relevant to wellbeing, and use these as a 'proxy' for their wellbeing. These aspects include things such as physical health, mental health, life expectancy, household income, standard of living (for example, quality of housing), and relationship status (see for example Durand 2015). Key challenges with the objective approach are measuring each aspect in ways that are comparable between people. For example, the same level of household income will have very different effects on the wealth of people with differently sized households and different costs of living.

The subjective wellbeing approach involves asking people to self-rate their wellbeing. This is most commonly done by asking them to self-rate (see Schirmer et al. 2015 for a summary of key measures):

- Their overall satisfaction with their life
- Their overall satisfaction with a number of factors known to influence overall wellbeing ('wellbeing pathways'), such as their standard of living, security, safety, relationships, and sense of achievement in life.

Subjective measures of wellbeing have the benefit of being simpler to measure in a way that is comparable across different circumstances, as the person who is rating their wellbeing is able to take those circumstances into account when making their rating. The subjective and objective approaches have fewer differences than at first apparent. In a review of evidence, De Neve et al. (2013) found that subjectively rated wellbeing is a good predictor of many objective outcomes, and vice versa.

Two measures of a person's overall wellbeing are particularly useful in the Australian context, because they are measured in a wide range of surveys, ensuring that the measures have been well tested and that comparison data are available to which the wellbeing of landholders engaging in NRM can be compared (see Schirmer et al. 2016, from which the following text has been reproduced):

1. **Global Life Satisfaction (GLS):** Global life satisfaction is measured using a single item that asks respondents to indicate how satisfied they are with their 'life as a whole'. Responses are recorded on a scale ranging from 0 (not at all satisfied) to 10 (very satisfied). In this hedonic measure of wellbeing, the person answering the question is not asked to identify which aspects of their life they are more or less satisfied with, but instead to give an overall rating of satisfaction. The 11 point scale is generally accepted as user-friendly in self-completion surveys while consistently proving to be of higher sensitivity to a person's discriminative capacity and when compared to five or seven point scales (Cummins, 2003). In reporting this measure, scores are multiplied by 10 to adjust the scale to a measure from 0 to 100. The GLS item is widely used in wellbeing surveys in Australia and internationally.
2. **Personal Wellbeing Index (PWI):** The PWI was developed in Australia by researchers based at the Australian Centre on Quality of Life, and further information about its extensive use both in Australia and internationally can be found at http://www.acqol.com.au/iwbg/wellbeing-index/. This index also uses a hedonic approach to measuring wellbeing, but instead of asking respondents to rate their overall level of satisfaction, they are asked how satisfied they are with the following aspects of their life: (i) your standard of living, (ii) your health, (iii) what you are

currently achieving in life, (iv) your personal relationships, (v) how safe you feel, (vi) feeling part of your community, and (vii) your future security. Extreme values (where a respondent indicated a score of 0 or 10 for all of the seven items) are removed from the sample and a mean score is then calculated. This produces a measure which ranges from 1 to 99 (International Wellbeing Group, 2013).

These two overall measures of wellbeing can be used in conjunction with measures that determine effects of engaging in NRM activity on the aspects of subjective wellbeing that are examined by the GLS and PWI measures.

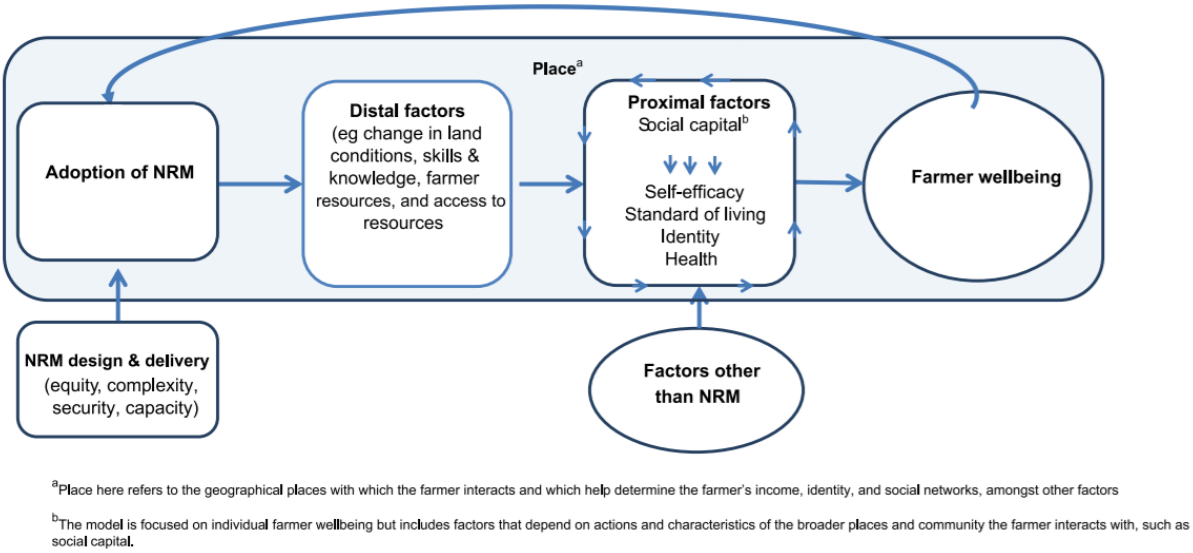
2.3 Wellbeing pathways likely to be influenced by NRM

A large literature has identified a wide range of factors that influence a person's wellbeing. These range from factors such as personality traits to experiencing difficult times such as drought, loss of employment, or loss of a loved one. While this broader literature exists, it is not necessarily of relevance to assessing the effects of engaging in an NRM activity on wellbeing: engaging in establishing a drought lot is unlikely to change a person's inherent personality traits, for example.

A small but growing number of studies in recent years have identified 'pathways' by which change in natural resource management and access to natural resources influence human wellbeing. The best known of these is the Millennium Ecosystem Assessment (Millennium Ecosystem Assessment 2005), which identified a number of pathways by which access to natural resources contributes to health and wellbeing. For example, it identified that health of natural resources affected access to heating, food, clean water, pleasant landscapes, and other factors. Since this time a number of variants on this type of framework have been produced.

Within Australia, a framework has been proposed for understanding the social and economic effects of NRM activities. In a review and synthesis of 45 previous studies examining the social and economic outcomes of engaging in NRM activities, Schirmer et al. (2013) found that evidence to date suggested that engaging in NRM may affect a person's social and economic wellbeing through five specific pathways, in which engaging in NRM changes a person's access to social capital, self-efficacy, standard of living, identity and health. The overall framework is shown in Figure 1. Each of the pathways, and how it may apply in NRM, is described below.

Standard of living: Standard of living simply means the ability of a landholder to have a satisfactory standard of living, meaning an income high enough to provide appropriate housing, food and ability to meet living costs (Schirmer et al. 2013). Having access to an appropriate standard of living has been shown in multiple studies to have an important influence on a person's overall wellbeing, although this effect on wellbeing typically reduces with increasing wealth (Cummins 2000). A landholder's standard of living is affected by both the costs of land management, income earned from their land, and income earned off the land. These are in turn affected by a wide range of factors. Engaging in NRM can influence a person's standard of living in many ways. For example, it may change the cost of land management (increasing or decreasing costs of weed and pest control, grazing management, soil fertiliser requirements, or many other aspects). It may change the amount of revenue able to be earned from a property, through increasing land productivity, or removing an area from production in order to promote regeneration of vegetation. It may also change the amount of labour required on the land, which in turn affects the landholder's capacity to use that labour time to earn other income.



[a]Place here refers to the geographical places with which the farmer interacts and which help determine the farmer's income, identity, and social networks, amongst other factors

[b]The model is focused on individual farmer wellbeing but includes factors that depend on actions and characteristics of the broader places and community the farmer interacts with, such as social capital.

Figure 1 Pathways by which engaging in NRM may affect the wellbeing of Australian farmers (Source: Schirmer et al. 2013)

Self-efficacy: Self-efficacy, put simply, is the extent to which a person feels confident in their ability to achieve desired outcomes in life. For example, in the farming context, a farmer who has a high level of self-efficacy will be confident they have the ability to achieve farming objectives such as maintaining groundcover, achieving a positive financial return, and coping with challenging circumstances such as drought. Self-efficacy is well established to be an important predictor of overall wellbeing, and an important predictor of resilience in challenging times such as drought (see for example Berkes and Ross 2013, Schirmer et al. 2017). Engaging in NRM can influence a landholder's self-efficacy in many ways. For example, learning new skills and gaining new knowledge about land management through NRM activities can reinforce self-efficacy. Receiving assistance to change land management (for example through restructuring grazing subdivisions) can help a farmer feel better able to achieve positive outcomes from their land management. Being supported to invest in actions that can help reduce the negative impacts of difficult times such as drought, for example through assistance to establish a stock management area, can improve a farmer's confidence in their ability to cope with these challenges and hence improve their overall self-efficacy and wellbeing.

Identity: A person's identity is, put simply, the concept a person has of themselves, and of what it means to be a 'good' person. Multiple studies have examined the central role of occupational identity to farmers: fulfilling what it means to be a good farmer is central to a farmer's wellbeing, and in many cases farmers have been found to have multiple aspects of a farming identity, with these aspects including finding it important to make a positive economic return from the farm and maximize farm productivity, to be a good steward of the land, and to engage in the lifestyle associated with being on the land (see for example Burton and Wilson 2006, McGuire et al. 2013, Sulemana and James 2014). Identity and wellbeing go hand in hand (Albrecht et al. 2007), and in many ways identity and self-efficacy are similar pathways: helping a farmer achieve the things that are important to their identity will help

maintain and improve their wellbeing. This will often involve an increase in self-efficacy, as well as supporting mental health. NRM activities may help fulfil a farmer's identity if they help achieve goals important to the farmer such as good land productivity, good groundcover, a pleasant farm landscape, and being a 'good steward' of the land. This is likely to be reflected in things such as a farmer reporting feeling pride and a sense of achievement from their NRM activities.

Social capital: Social capital is often referred to as the 'glue' that holds communities together, and simply means the extent to which a person feels a sense of belonging and connection to others through having positive social networks. These social networks provide a range of resources that support wellbeing, including access to resources (a referral to a person who might have a job on offer, a list to a social occasion, the loan of a car, child minding or, in the case of farmers, assistance with key farming activities, advice and ideas), and emotional support. Multiple studies have reinforced that a person's social capital is one of the most significant predictors of their overall wellbeing (see for example Helliwell 2006). If an NRM activity leads to improved social connections or reinforcement of existing social connections, this will be supportive of wellbeing; if it leads to disagreement or conflict, this has potential to reduce wellbeing. Examples of this include studies showing landholders making new social connections as part of Landcare groups, which provide them with valuable support for their farming, advice and resources.

Health: A person's mental and physical health is central to their wellbeing. Engaging in NRM may influence physical health through changing the amount and type of physical activity a landholder engages in. It may influence mental health through things such as changing their level of stress, anxiety, uncertainty about the future, pride, sense of achievement, and fulfilment of their identity.

2.4 Framework for measuring impact of NRM on key wellbeing pathways

The previous parts of this section identified the theoretical pathways by which engaging in NRM may influence wellbeing. This then needs to be transformed into a framework by which the effect of NRM on these pathways can be measured and tracked.

Figure 2 shows the framework used to identify the effects of the NRM activities invested in by Riverina LLS on landholder's social and economic wellbeing:

- First, the overall satisfaction of the landholder with the NRM activity is examined, by asking the landholder to rate their overall satisfaction.
    - A low rating indicates the activity is likely to have had some kind of negative effect on wellbeing, although the strength and nature of the wellbeing pathway is unknown: this may be anything from a minor annoyance causing a temporary frustration and short-term dip in wellbeing, through to a long-term major impact on wellbeing
    - A neutral rating (neither dissatisfied or satisfied) indicates no likely measurable effects on wellbeing
    - A positive rating (satisfaction) indicates a positive impact on wellbeing, although the strength and exact nature of that pathway cannot be determined based on the satisfaction rating alone

This basic assessment of satisfaction provides an overall understanding of the direction of effect different NRM activities have on wellbeing and can be analysed to identify whether only some types of landholders experience positive or negative outcomes.

- Second, landholders are asked to provide more detailed evaluation of the effects of NRM activities that have had a significant effect for them. They are asked to specifically evaluate their effect on the different pathways to wellbeing identified as likely to be influenced by NRM, namely:
    - Effect on standard of living (land management costs, land productivity, farm profitability, labour time)
    - Effect on self-efficacy, identity (effect on knowledge, skills, pride, sense of achievement, ability to cope with challenges)
    - Effect on social capital (amount and type of social interaction)
- Effect on health (stress, anxiety, physical activity)

In all cases, they are able to identify both negative and positive effects, and the strength of these. Responses are analysed to identify which pathways landholders identified. For example, if landholders identify that engaging in an NRM activity led to no changes in any of these, then the NRM activity has not changed any pathways to wellbeing and can be confidently said to have had no impacts on wellbeing. If a landholder indicates a negative impact on standard of living but an overall positive impact on self-efficacy, this indicates NRM is influencing multiple pathways to wellbeing.

- Third, the impact of NRM on overall wellbeing is asked about, to help identify if the overall effect of these different pathways on wellbeing is positive or negative. Overall satisfaction ratings can also be used to inform these.
- Finally, the overall wellbeing of landholders can be assessed, and compared for those who report more and less impact of NRM on different aspects of wellbeing, to identify whether there is any measurable effect. However, in many cases any effects will not be readily observable as this overall level of wellbeing is also influenced by the many other factors that also influence wellbeing.

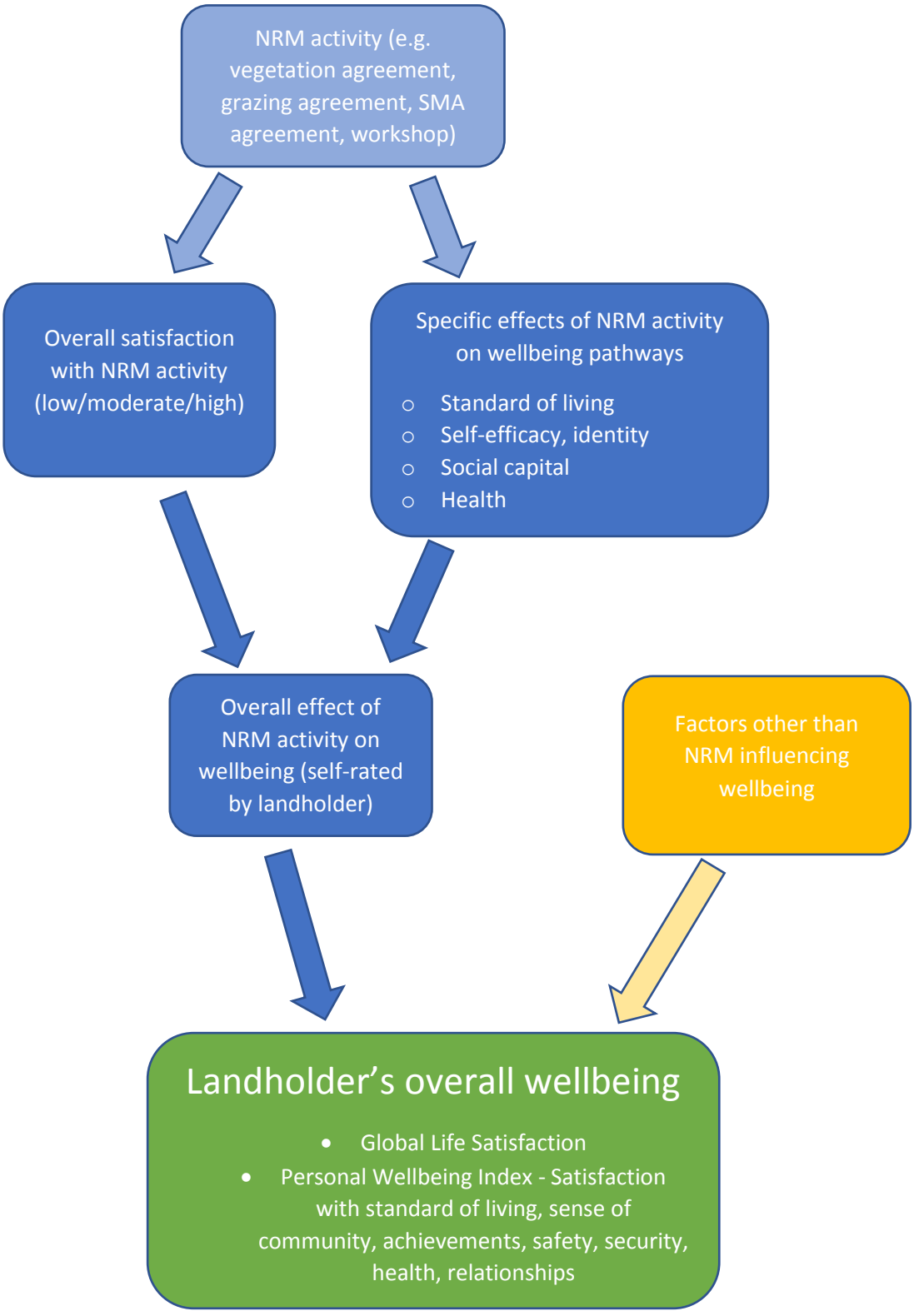


Figure 2 Framework for assessing effects of NRM activities on social and economic wellbeing

3. Methods

This section describes the survey development, data collection and analysis methods.

3.1 Questionnaire design

The questionnaire was designed using a multiple step process:

- Review of Riverina Local Land Services activities to identify the scope of activities to be included in the questionnaire
- Review of recent studies examining social and economic outcomes of investment in NRM activities
- Development of initial draft questions
- Review of draft questions by Local Land Services staff
- Revised questions pilot tested with 7 participants, who completed the survey online and provided comments on changes they believed were needed. This included a mix of landholders, Local Land Services staff, and Landcare staff (most pilot testers had more than one role, with staff who were landholders selected to pilot test the survey as well as three landholders who were not NRM staff)
- Final revision of questionnaire.

The final questionnaire was formatted in both online and paper versions. Appendix 1 contains the full paper version of the survey. The online survey contained identical questions, and was hosted in Qualtrics (www.qualtrics.com). The online survey differed from the paper survey only in one aspect: participants were automatically 'piped' to questions applicable to them based on their previous answers, ensuring that questions not relevant to them were not displayed.

3.2 Sample frame

The sample frame was defined as all Riverina landholders who had participated in a significant activity with Riverina Local Land Services in the last five years. 'Significant' here means there was a sustained engagement with an NRM activity, rather than a one-off discussion by phone. The sample frame was generated based on the Riverina Local Land Services database of landholders, which was interrogated to identify landholders who had engaged in entering an agreement, received a grant, participated in a training course or workshop, or received advice from a Local Land Services staff member. Landholders who had applied to enter an agreement or receive a grant but were not successful (with no work undertaken) were excluded, as were those where works had not yet occurred on the land as part of a signed agreement. In total, 401 landholders were identified who met these criteria.

The survey examined Riverina Local Land Services activities and Landcare activities. The sample frame focused on landholders who had engaged in Local Land Services activities. The survey was also made publicly available on the Riverina Local Land Services website, enabling landholders who may have participated in Landcare but not Local Land Services activities to participate.

3.3 Survey delivery

The survey was delivered using both mail and online survey forms. As privacy considerations meant that the contact details of the sample frame could not be supplied to the University of Canberra, Riverina

Local Land Services sent emails and mailed materials on behalf of the researchers. The contact process used to encourage participation in the survey was:

- Initial email sent to those landholders who had email addresses, explaining the purpose of the survey and how to participate in it, and that a paper survey would be posted to them or they could choose to do the survey online. Of the sample frame, 71% had email and postal addresses, while the remaining 29% had only postal addresses.
- Survey pack sent to all landholders with a cover letter explaining the survey and encouraging participation, and an information sheet and postage paid return envelope
- First reminder, sent by email to those with valid email addresses, and by post to those with only a postal address. This was sent around one week after postage of the survey pack.
- Second reminder, sent by email to those with valid email addresses, and by post to those with only a postal address. This was sent around two weeks after postage of the survey pack.

Each communication included an explanation of how the landholder could contact either the researchers or Riverina Local Land Services to request they be removed from subsequent mailings. It also explained the landholder could complete the survey either online or on the paper survey form they had been sent. Landholders could call a free call phone number to request assistance if they wished.

Of 401 landholders included in the survey, a total of 23 either had invalid addresses, had shifted, or had a change in circumstances such as no longer managing the property that meant they were not a valid survey respondent. This reduced the sample frame to 378. In total, 113 valid survey responses were received, with an overall response rate of 29.9%.

3.4 Data analysis

Surveys completed on paper were entered into the online survey form. Data were then downloaded and cleaned, by removing invalid surveys (defined as those where the person did not answer questions evaluating their NRM activities) and checking accuracy of entered data. Data were then analysed using the software packages Microsoft Excel and SPSS.

3.5 Analysis of other data

Data from the 2016 Regional Wellbeing Survey were drawn on to compare the wellbeing of landholders who had engaged in NRM activities with the wellbeing of other landholders living in the Riverina region. These data are described as they are drawn on in the results section, and further information on the Regional Wellbeing Survey, including detailed description of the methods used to collect data, are available at www.regionalwellbeing.org.au.

4. Results

Results of the survey are presented in five sections. First, the characteristics of landholders who participated in the survey are briefly described. Second, the types of NRM activities landholders engaged in are examined. Third, overall satisfaction with those activities is analysed. This is followed by detailed evaluation of the extent to which landholders who entered agreements reported that the agreement led to change in different social and economic wellbeing pathways. Finally, the overall wellbeing of landholders is examined and compared to that of landholders in the Riverina Local Land Services region more broadly, using data from the 2016 Regional Wellbeing Survey.

4.1 Landholder characteristics

The 113 respondents were analysed to identify the types of land management they engaged in, and their demographic characteristics. These are summarized in Table 1. All those who responded to the survey managed their land for commercial farming, typically managed more than 1,000 hectares (with an average of 1,781 hectares managed), the majority engaged in either mixed cropping and grazing (49%) or grazing enterprises (51% including sheep and beef graziers). Very few were engaged in irrigated agriculture, fruit or vegetable growing. Just over half (52%) had spent 30 years or more in farming, but only 30% had managed their current property or properties for more than 30 years, and 19% had managed their current property/ies for less than five years. Farm economic size varied substantially, from a gross value of agricultural production (GVAP) of less than $50,000 to more than $2 million in 2015-16. A majority (59%) had no off-farm work, while 18% worked part-time off farm and 23% worked full time off farm. Most (78%) of survey respondents were male, 19% female and 3% either had a different gender identification or preferred not to answer. The majority were aged 50 or older (62%). Almost half (46%) had a university degree. When asked to rate the financial prosperity of their household, 68% rated themselves as ‘reasonably comfortable’, only 13% as ‘just getting along’, none rated themselves as very poor or poor, and 18% rated themselves as very comfortable or prosperous. Most were highly satisfied with most aspects of their life, with ratings of 80 or more out of a possible 100 for most measures of wellbeing.

Table 1 Characteristics of landholders who responded to the survey

Landholder or land management characteristic	Proportion of survey respondents with differing characteristics	
Number of years landholder had managed property on which they had engaged in NRM (n=101)	Less than 5 years 5 to 9 years 10 to 19 years 20 to 29 years 30 years or more	19% 17% 18% 17% 30%
Area of land owned (across all properties if landholder owned more than one) (n=98) Note: precise figures not provided for minimum and maximum areas to ensure no landholder can be identified in results	Mean area Minimum Maximum	1,781 ha <100 ha >25,000 ha
Proportion of landholders who also managed land they did not own e.g. through leasing, sharefarming (n=98)	% landholders Median area managed	24.5% 700 ha
Farm type (n=100) Note: As only a small number of respondents (<5) indicated they grew cotton, rice or winegrapes, and all of these also engaged in grazing of sheep or cattle, or broadacre cropping of legumes, grains or oilseeds, they were included in the category of 'mixed cropping and grazing. Only one landholder engaged in cropping with no grazing; this landholder was included in the 'mixed cropping and grazing' category. No landholders who participated indicated using their land for residential purposes only. Seven landholders also engaged in other types of land management such as horse breeding or goat production.	Beef cattle grazing Sheep-beef grazing Mixed cropping and grazing Sheep grazing	18% 23% 49% 10%
Years spent in farming (n=102)	Less than 5 years 5 to 9 years 10 to 19 years 20 to 29 years 30 years or more	6% 9% 15% 19% 52%
Gross value of agricultural production 2015-16 (n=96)	<$50,000 $50,000-$99,999 $100,000-$199,999 $200,000-$399,999 $400,000-$749,999 $750,000-$999,999 $1 million to $1.99 million $2 million or more Prefer not to answer	15% 8% 19% 13% 9% 6% 11% 7% 11%
Engagement of landholder in off-farm work (n=101)	No off-farm work Part-time off-farm work Full-time off-farm work	59% 18% 23%
Engagement of landholder's partner/spouse in off-farm work (n=96)	No off-farm work Part-time off-farm work Full-time off-farm work Not applicable	42% 28% 23% 7%
Type of farming (n=95)	Dryland farmer Irrigator	95% 5%

Landholder or land management characteristic	Proportion of survey respondents with differing characteristics	
Gender (n=104)	Female Male Other/prefer not to answer	19% 78% 3%
Age (n=100)	Younger than 30 30-39 years 40-49 years 50-59 years 60-69 years 70 years or more	2% 11% 25% 28% 23% 11%
Aboriginal landholders (n=104)	Aboriginal Not Aboriginal	1% 99%
Highest level of formal education (n=104)	Did not complete high school Year 12 or equivalent Certificate/diploma from TAFE University degree	9% 15% 30% 46%
Self-rated household financial prosperity (n=104)	Very poor/poor Just getting along Reasonably comfortable Very comfortable Prosperous	0% 13% 68% 15% 3%
General health (n=100)	Poor or fair Good Very good Excellent	9% 18% 28% 45%
General life satisfaction (score from 0-100) (n=103)	Mean score	83
Satisfaction with standard of living (score from 0-100) (n=103)	Mean score	82
Satisfaction with health (score from 0-100) (n=103)	Mean score	76
Satisfaction with future security (score from 0-100) (n=103)	Mean score	81
Satisfaction with what currently achieving in life (score from 0-100) (n=103)	Mean score	81
Satisfaction with personal relationships (score from 0-100) (n=103)	Mean score	83
Satisfaction with feeling part of your community (score from 0-100) (n=103)	Mean score	80
Satisfaction with how safe you feel (score from 0-100) (n=103)	Mean score	89

4.2 NRM activities

Landholders were asked which types of NRM activities they had engaged in during the last five years. As the sample was deliberately selected to include landholders who had engaged with Riverina Local Land Services, this question was intended to identify the proportion of those who responded who had participated in different types of NRM and, as a result, which types of NRM activity could be evaluated based on the survey responses. Shown in Figure 3, the most common types of NRM activity were entering an agreement to either protect existing vegetation, plant or seed new vegetation, or encourage regeneration of vegetation (85%), followed by receiving one-to-one advice from a Local Land Services or Landcare staff member (62%). Fewer had attended a paddock walk or paddock demonstration (37%), attended a workshop or training course (33%), attended an NRM or Landcare social event (32%), received a Landcare grant (30%), entered a grazing management agreement (30%), received a grant from Riverina Local Land Services (other than entering a formal agreement) (28%), entered into an agreement to establish a stock management area (25%), or attended a Landcare nature walk (21%).

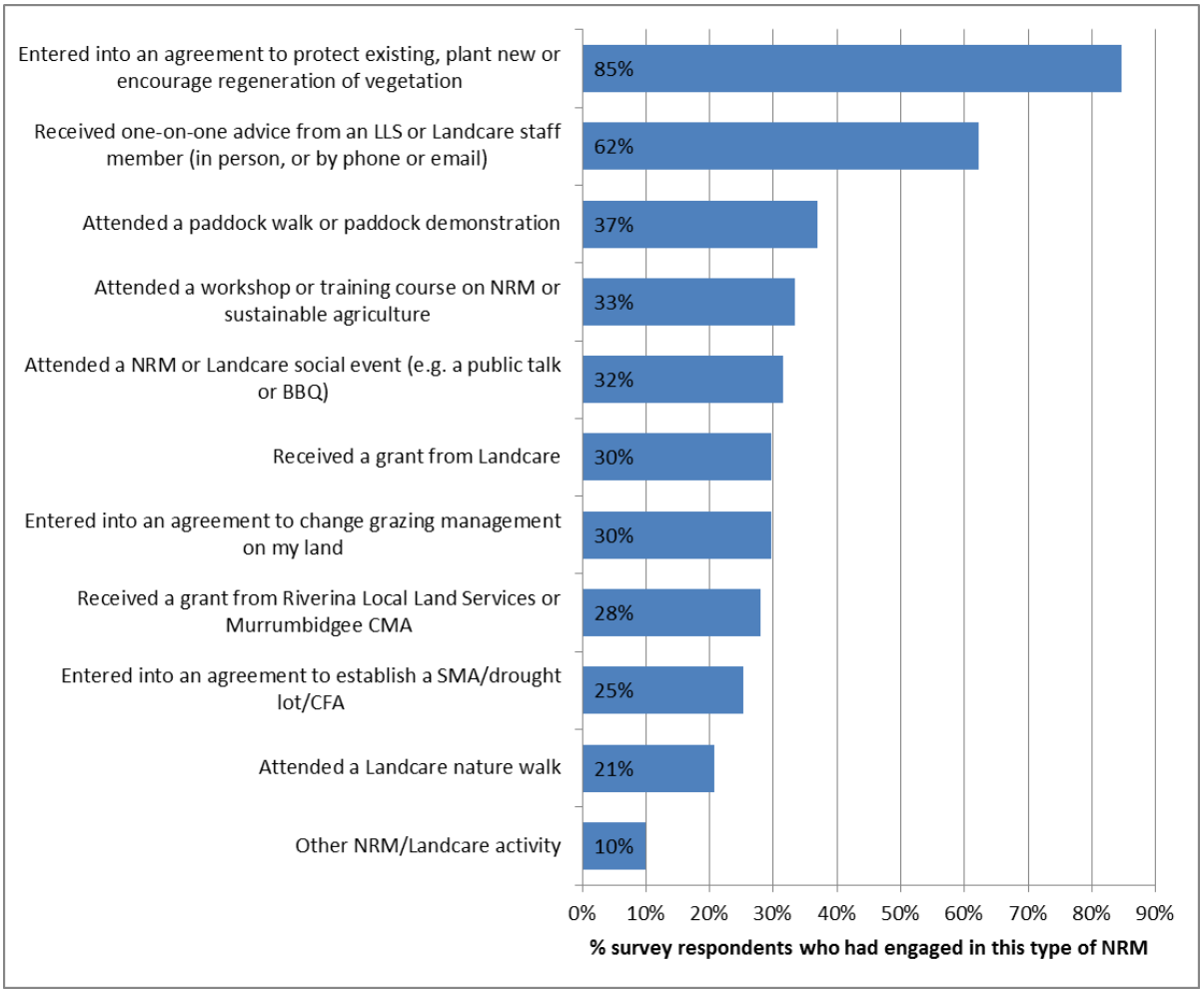


Figure 3 Proportion of survey respondents who had engaged in different types of NRM activity since 2012

Some landholders reported engaging in multiple NRM activities and others in one or two:

- 35% had engaged in one or two activities in the last five years
- 34% had engaged in three to five activities
- 31% had engaged in six or more NRM activities.

Many landholders had engaged in the same types of activities more than once in recent years. For example, as shown in Figure 4, many of the 85% of landholders who had entered a vegetation agreement had entered more than one over recent years, with many reporting entering a vegetation agreement in more than one of the time periods asked about in the survey.

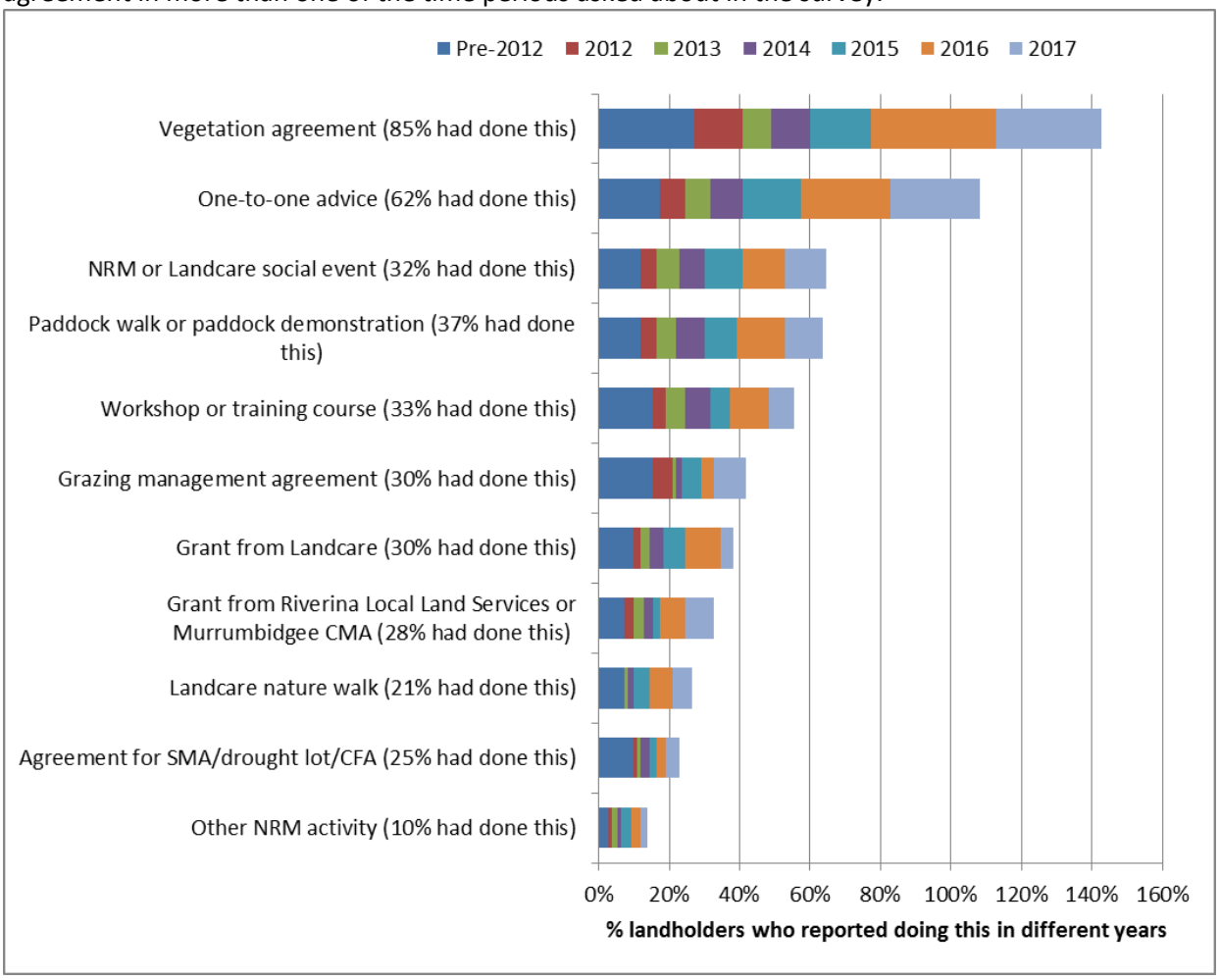


Figure 4 Years in which landholders reported having engaged in different types of NRM activity (many had undertaken an activity more than once)

4.3 Satisfaction with NRM activities

Landholders were asked to rate their overall level of satisfaction with the different NRM activities they had taken part in. This assessment provides a useful indicator of the overall direction and nature of any impacts of the NRM activity on social and economic wellbeing: a landholder is unlikely to be satisfied with an activity that had negative impacts on their wellbeing, and unlikely to be dissatisfied with one that was overall positive for their wellbeing.

Satisfaction with NRM agreements

Landholders who had entered an agreement with Riverina Local Land Services were asked (i) the types of activities involved in the agreement, and (ii) how satisfied they were with the work done and the outcomes of the agreement. Landholders could answer this question for up to two agreements they had participated in. A total of 98 landholders who had participated in agreements answered this part of the survey, for a total of 142 agreements they had entered, with 44 landholders answering for two separate agreements.

Overall the large majority of landholders reported being satisfied with the work done and outcomes of agreements they had entered into with Riverina Local Land Services (Figure 5), irrespective of the specific nature of the agreement (for example, whether it involved revegetation, grazing management, or establishment of a stock confinement area).

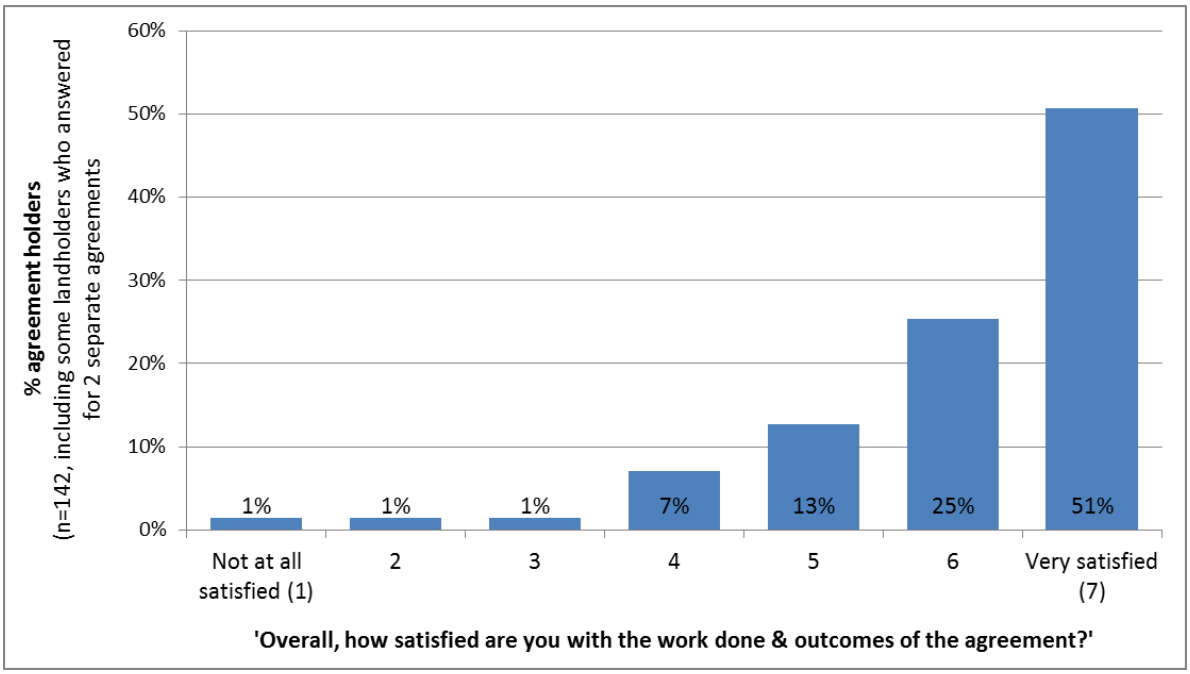


Figure 5 Overall satisfaction of landholders with agreements they had entered into with Riverina Local Land Services (n=142)

This high level of satisfaction was very similar irrespective of the type of agreement entered into (Figure 6): the 'average' (mean) satisfaction score across all agreements was 5.3 out of a possible 7 (rated from 1 = not at all satisfied to 7 = very satisfied). The average score for different types of agreement ranged between 5.0 and 6.0 and where numbers of landholders responding was higher than 20, was typically almost identical to the average of 5.3 across all types of agreements. This indicates high satisfaction with all types of agreements, including agreements to protect, plant or encourage vegetation ('vegetation

agreements), to manage grazing to improve groundcover ('grazing agreements'), to establishment stock management areas (also termed drought lots and confinement feeding areas) ('SMA agreements'), or other agreements.

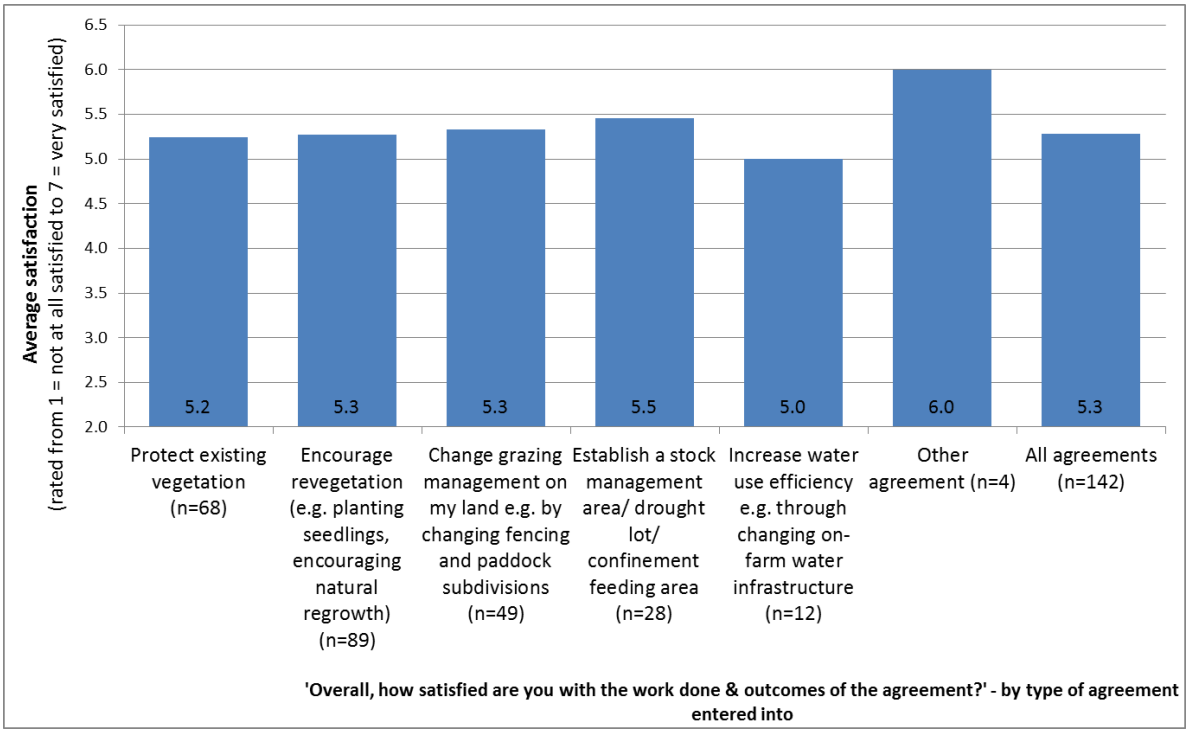


Figure 6 Overall satisfaction of landholders with agreements they had entered into, by type of agreement

Landholders were then asked what types of actions they had taken on their land as part of the agreements they had entered. This was asked because agreements can differ substantially: one agreement for vegetation regeneration might involve pest control while another involves fencing a riparian area, for example. Most landholders who had entered an agreement reported that it involves three or four of the actions listed in Figure 7. Figure 7 shows the average level of satisfaction of landholders with their NRM agreement, by type of activity involved. Satisfaction did not differ substantially, with the average level of satisfaction having no significant differences when the different activities engaged in as part of agreements were compared.

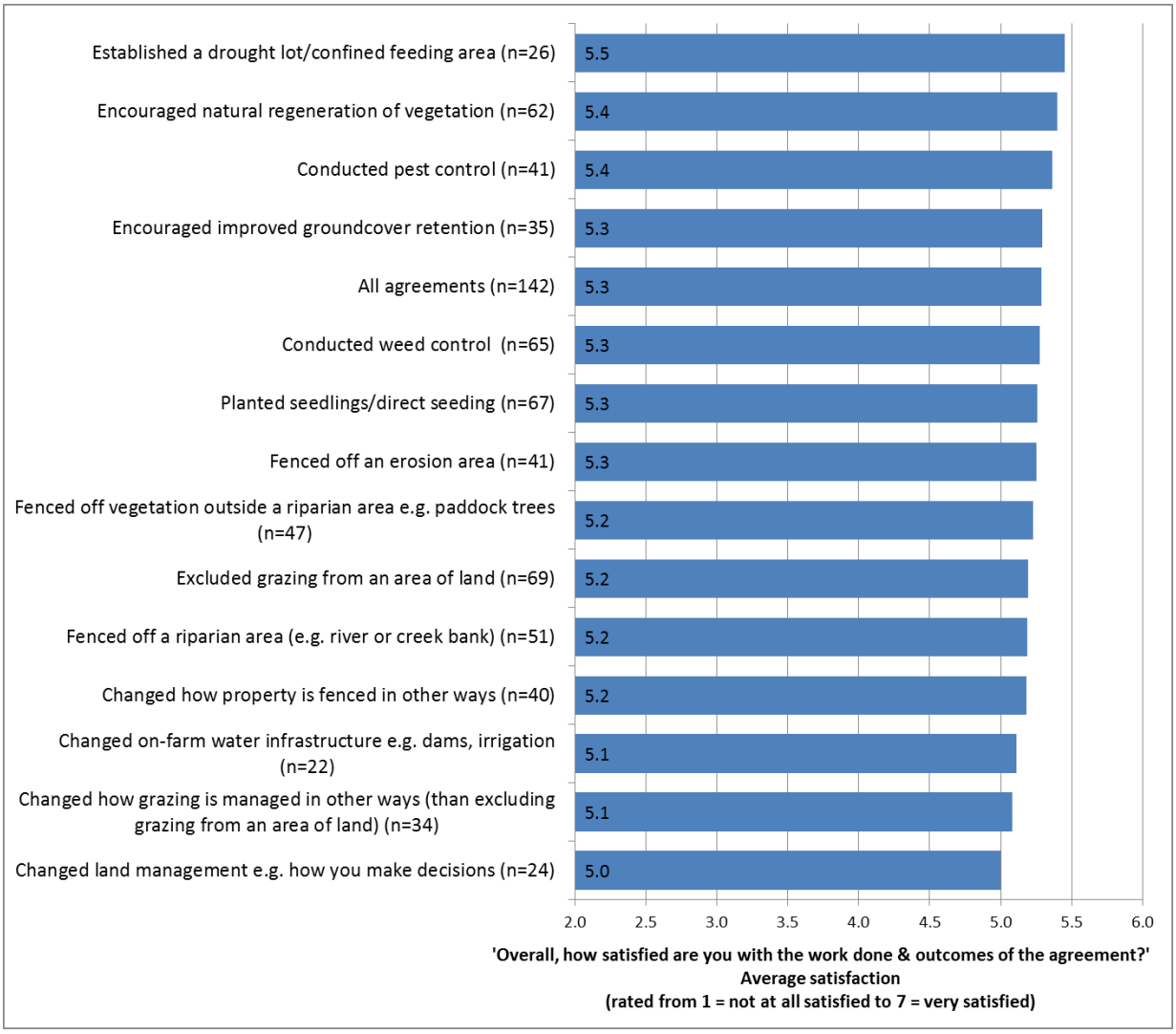


Figure 7 Overall satisfaction of landholders with agreements they had entered into, by type of activities involved in the agreement

Satisfaction with workshops/training courses

Landholders who had attended workshops or training courses were asked more about the types of workshops or training courses they had participated in, and asked how satisfied they were with each type they had taken part in. They could answer this question for up to three workshops/training courses they had participated in. In total, 48 landholders answered this question, and rated a total of 90 workshops they had attended, with most of these landholders having attended two or three workshops in total. Interestingly, more landholders answered this question than had earlier indicated they had participated in a workshop in the last five years, suggesting some had participated in a workshop more than five years previously.

Levels of overall satisfaction with workshops and training courses were very high: as shown in Figure 8, when asked to rate satisfaction from 1 (not at all satisfied) to 7 (very satisfied), almost all landholders who had attended workshops or training courses rated their satisfaction as ‘6’ or ‘7’ (85%).

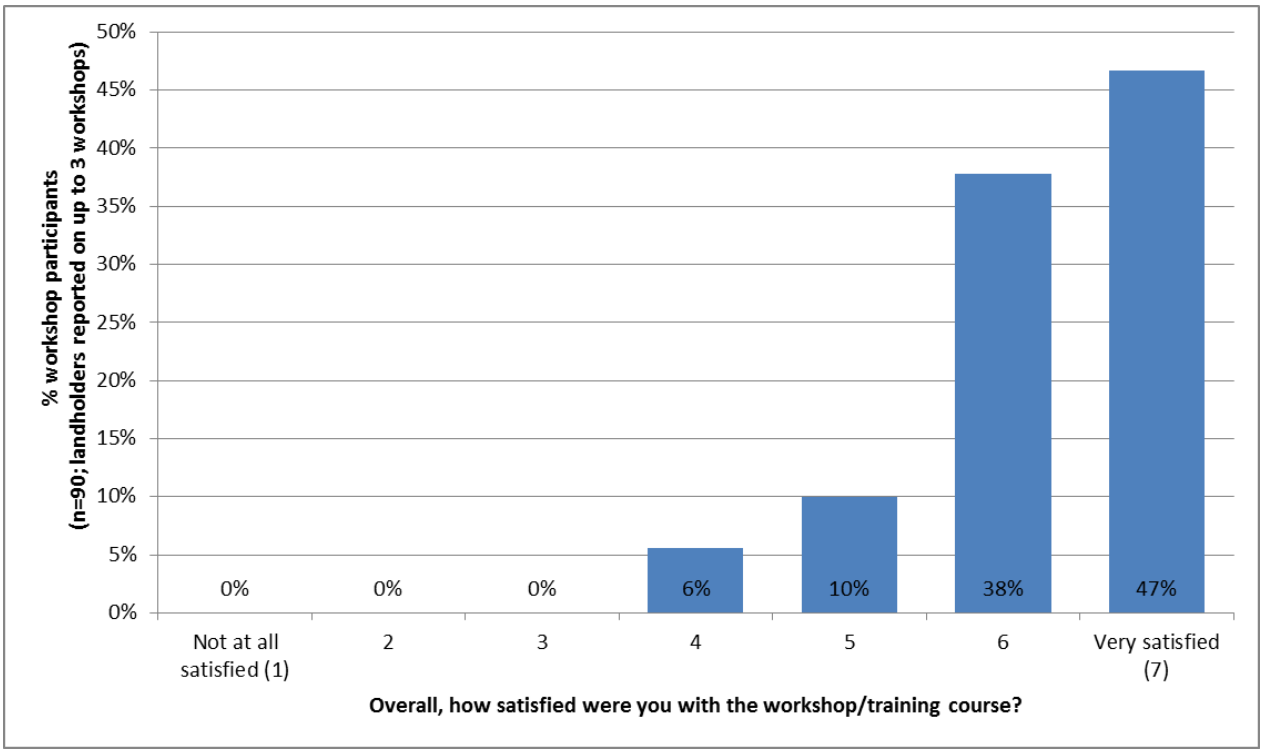


Figure 8 Overall satisfaction of landholders with workshops/training courses they had participated in that were organised by Riverina Local Land Services (n=142)

Very similar satisfaction levels were reported with most types of workshop, with a high average satisfaction rating for workshops involving use of technology, stubble management, crop nutrition, plant identification, soil health, remnant bush monitoring, pest animal control, threatened species, and animal health (Figure 9). Slightly lower average satisfaction was reported with workshops examining weed management/noxious weeds, and farmer health and wellbeing.

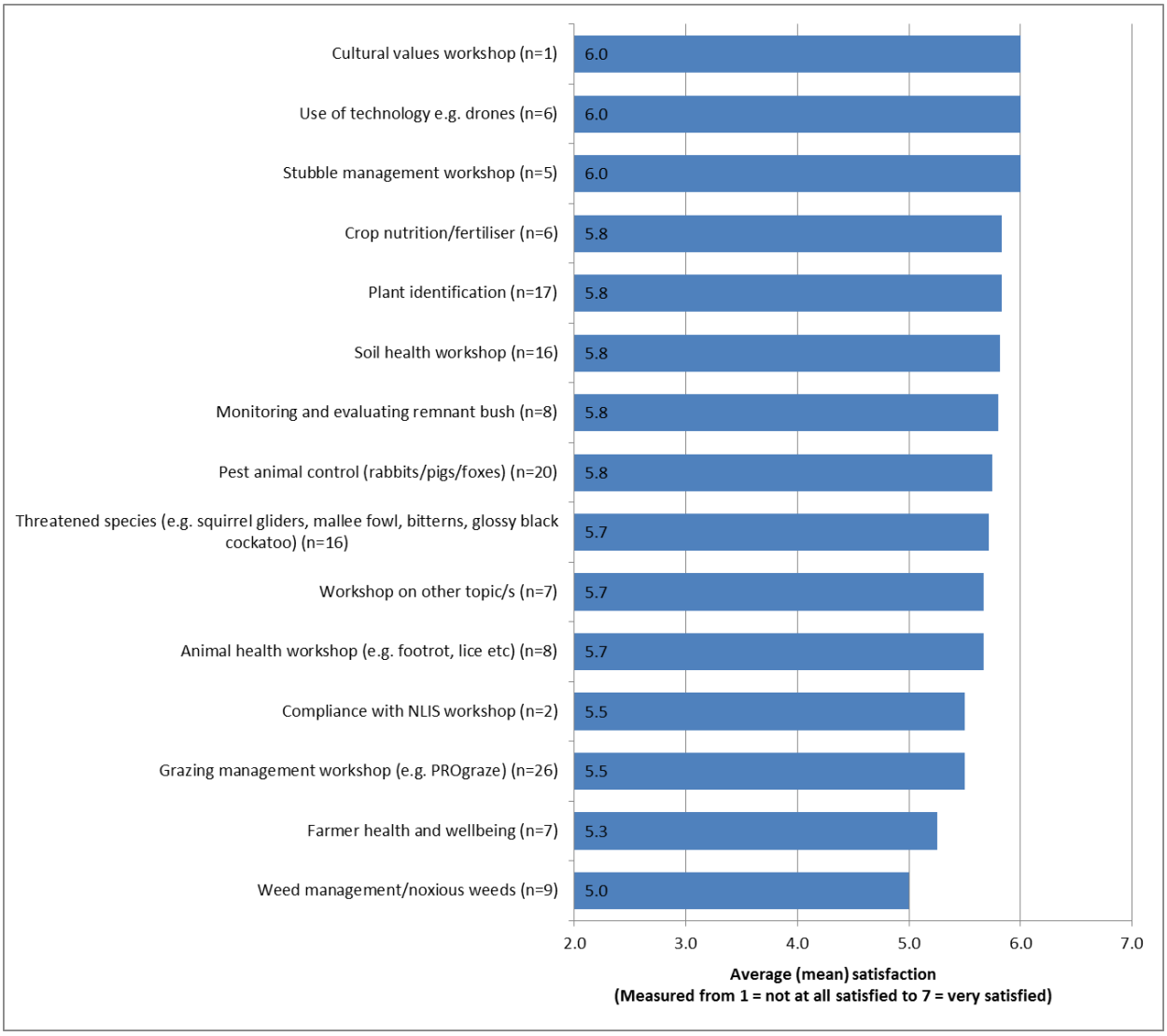


Figure 9 Overall satisfaction of landholders with workshops/training courses they had participated in, by type of workshop/training course

Satisfaction with one-to-one advice

Landholders who had received advice from a Local Land Services staff member were asked what year/s they had received advice in, the type of advice received, and whether they received advice in person, by email, or by phone. They were then asked to rate how satisfied they were with the advice process. Overall, most landholders reported being very satisfied with advice received (Figure 10), with most (82%) rating the advice '6' or '7' on a scale from 1 (not at all satisfied) to 7 (very satisfied).

Advice was provided on a wide range of topics to landholders. The types of advice were grouped into categories, shown in Figure 11. Similarly high levels of satisfaction were reported for most types of advice, with the exception of advice on completing grant applications, where satisfaction was lower for the small number of landholders who had received this type of advice. Overall, landholders were more likely to report high levels of satisfaction with advice received by phone or email, and slightly lower satisfaction with advice received in person, although differences were small (Figure 12).

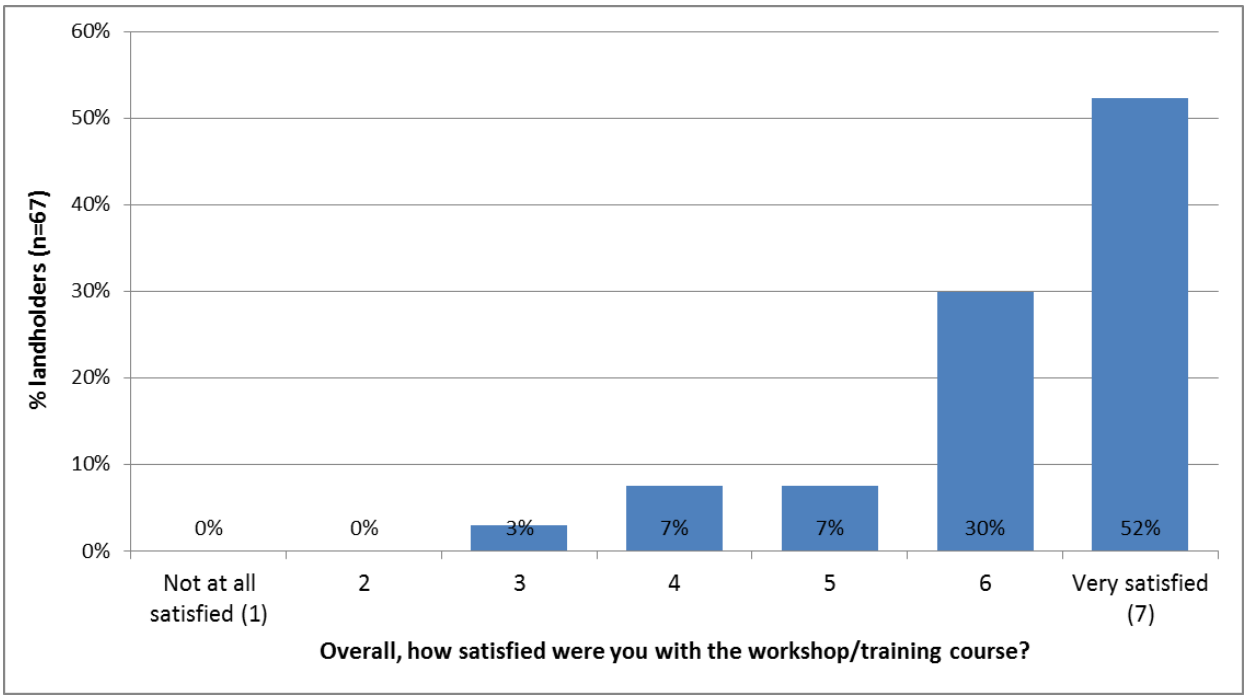


Figure 10 Overall satisfaction of landholders with advice they had received from Riverina Local Land Services staff (n=67)

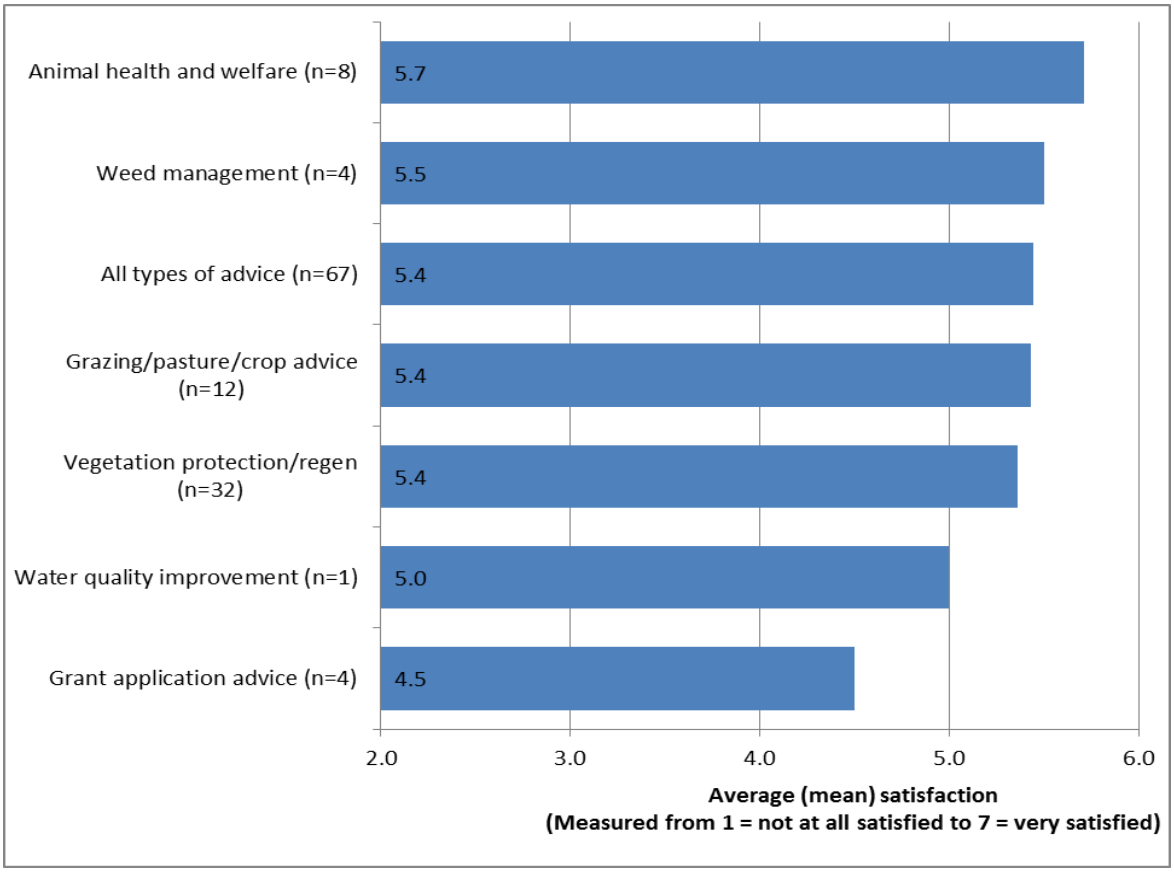


Figure 11 Overall satisfaction of landholders with workshops/training courses they had participated in, by type of advice received

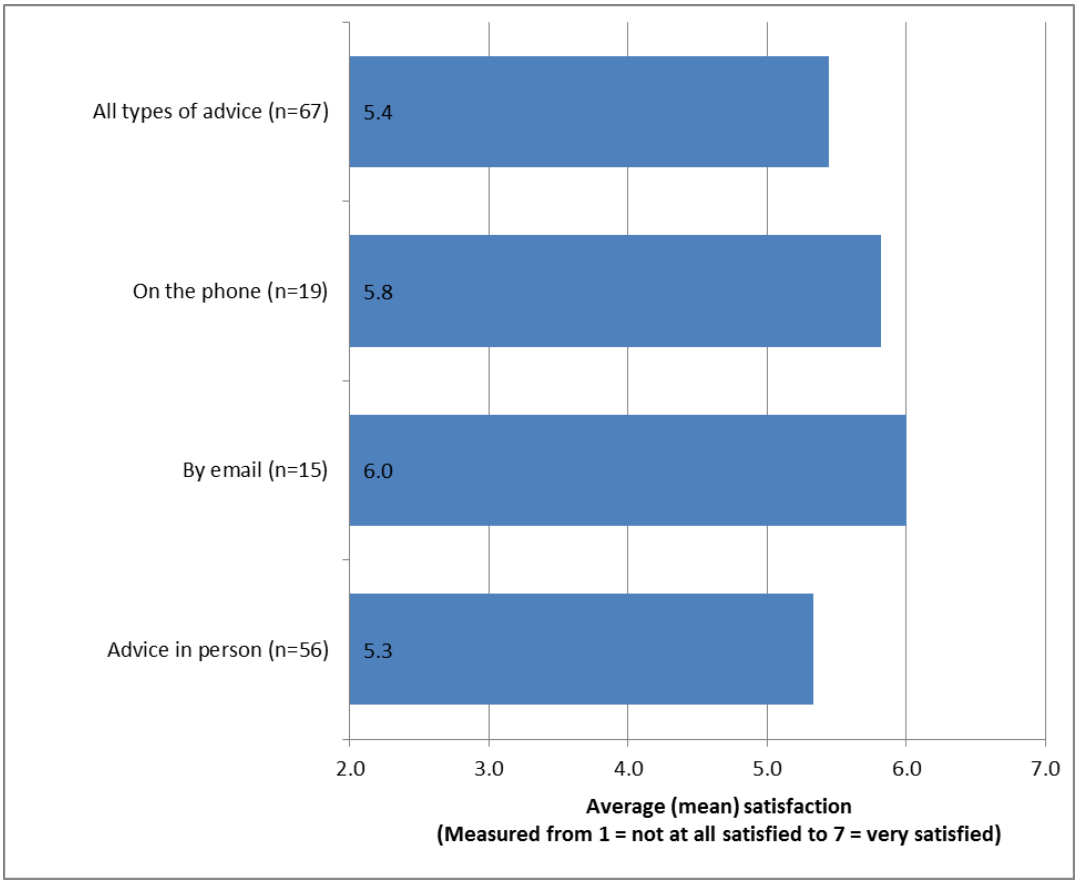


Figure 12 Overall satisfaction of landholders with workshops/training courses they had participated in, by method used to provide advice

Effects of NRM activities on wellbeing – conclusions based on satisfaction ratings

Overall, all of the activities evaluated were rated as slightly to very satisfactory by almost all landholders who participated in them, with less than 3% reporting dissatisfaction, and very few (5-7%) reporting being neither satisfied or dissatisfied. This means the overall impact of NRM activities on wellbeing is positive in almost all cases. However, data on overall satisfaction, while giving a picture of overall likely direction of effect (i.e. a positive effect on wellbeing in this case), does not indicate by what pathways the NRM activities may be influencing wellbeing, or how strongly. Section 4.4 examines this in more detail.

4.4 Effects of participating in NRM agreements on key wellbeing pathways

This section examines the effects of participating in NRM agreements on specific 'wellbeing pathways'. To do this, landholders were asked to nominate two NRM activities they had engaged in which they wished to evaluate in more detail in the survey. They were specifically asked to pick the two NRM activities that had been most important to them to evaluate, as it is these that are most likely to have had an effect on wellbeing. Of 96 landholders who nominated one or two activities, the large majority – 86 – nominated agreements with Riverina Local Land Services as the activities they wished to assess. The remaining 10 nominated either a Landcare grant, Landcare nature walk, workshop or other activity such as installing nesting boxes. The 86 landholders who evaluated agreements provided assessment of a total of 115 agreements they had entered into, with 29 evaluating two agreements and 57 evaluating one agreement.

The landholders were asked to describe the type of agreement they were evaluating. Of the 115 agreements:

- 13 were grazing agreements involving changing grazing management to improve groundcover
- 14 were stock management area/ drought lot agreements
- 88 were vegetation agreements involving actions such as fencing areas to protect existing vegetation or encourage natural regeneration (and often also to improve water quality), or planting or seeding new vegetation

The next sections present findings from the detailed evaluation of these agreements. First, results of open-ended questions in which landholders were asked to describe the (i) positive effects of the project, (ii) negative effects of the project, and (iii) changes they would recommend making, are presented. These provide an idea of how the landholder evaluates the effects of the project when not prompted by specific statements about the types of effects they may have.

Second, the extent to which the activities associated with the agreement impacted positively or negatively on workload, farm profitability, land productivity, land management costs, land management complexity, landholder stress or other emotions such as pride, ability to cope with challenges on the land, health of the land, landholder skills, and social activities, is assessed. This provides a detailed picture of whether the agreements had a positive or negative effect on known key pathways affecting a person's overall wellbeing.

Third, we examine if some types of landholders were more or less likely to report experiencing positive or negative effects on these different wellbeing pathways.

Descriptive evaluation: participant's views

For each agreement they evaluated, participants were asked to write their views about:

- Overall, what were the POSITIVE effects of this project or activity?
- Overall, what were the NEGATIVE effects and CHALLENGES of this project or activity?
- What changes would you recommend making to this project/activity in future?

The answers given by respondents were coded into themes, and are presented in Tables 2 to 4 below, which examine grazing agreements, stock management area agreements, and vegetation agreements.

Grazing agreements

Of the 13 landholders who provided written comments on their grazing agreements, twice as many provided comments about positive outcomes as identified negative outcomes. The most common comments were that the agreement (Table 2):

- Had positive impacts in the form of reduced grazing pressure, increased pasture health, improved vegetation health and regeneration, and improving targeted grazing management
- Had negative impacts in the form of high costs to the landholders, and difficulty of fencing challenging terrain
- Had little need for change, with only three landholders identifying preferred changes (more interaction with experts, agreement on costs and improved costing).

Most landholders focused on describing the effects of the agreement on land management (e.g. management costs, grazing methods) and land health, and did not comment in these initial open-ended questions on how these changes in land management and pasture flowed on to their own life. Even those who described high costs did not go on to describe how these high costs affected their financial wellbeing more broadly.

Table 2 Open-ended evaluation of positive and negative aspects of grazing agreements, and potential changes

Type of comment	Type of impact	No. of participants (n=13)	Examples of quotes
Positive	Reduced grazing pressure/ reduce impact of grazing on pasture	7	"Area fenced has shown increased ground cover and reduced grazing impact. Other parts of the (formerly one) paddock can now be grazed more evenly."
Positive	Improved pasture health	5	"Enables us to manage our grazing more efficiently and manage the health of our pastures."
Positive	Better management targeted to land type	3	"Better ability to manage the different land types, by being able to spell paddocks"
Positive	More revegetation, healthier vegetation	3	"better native pasture, environmental outcomes" "established revegetation in grass and trees" "fenced off a creek and revegetated"
Positive	Faster pasture recovery after grazing	3	"Areas are not over grazed and paddocks can recover quickly following grazing"
Positive	Better weed control	2	"Fenced off paddocks that contain goats for weed control"
Positive	Improved water quality	2	"Improved water quality"
Positive	Improved stock health	2	"Have paddock feed when shearing and shelter for shorn ewes"
Positive	Improved fencing	1	"Renewed fencing"
Negative	High costs to landholder (particularly fencing costs)	3	"[my share of] cost of fence was more than half" "the overall cost of the project was expensive"
Negative	Difficulty establishing and managing fencing around difficult terrain,	3	"Fencing in difficult areas was challenging at times"
Negative	None	2	
Negative	Difficulty completing works within timeframe of project	2	"Dealing with the weather"
Negative	Pest animals reducing benefit	1	"Kangaroos ate out spelled paddocks"
Negative	Overly generic grazing prescriptions	1	"I felt some of the grazing prescriptions were generic and could have been more targeted"
Changes	None	6	
Changes	Better agreement on works to be done before implementing - fencing	1	"Agree on fence type and standard"
Changes	Provide funding for actual cost, not minimum cost	1	"funding offered for a percentage of minimum cost option only, not actual cost"
Changes	More interaction with experts	1	"more interaction with experts"

Stock management area agreements

Of the 13 landholders who provided written comments on their stock management area agreements, most provided comments about positive outcomes and very few about negative outcomes or suggested changes. The most common comments were that the agreement (Table 3):

- Had positive impacts in the form of (i) improved health and maintenance of groundcover, and (ii) improved capacity to cope with periods of low rainfall and drought, as well as improving stocking options and overall productivity
- Occasionally had negative impacts on labour time of landholders, for two landholders
- Had little need for change, with only two landholders identifying preferred changes (enabling broader use of the yard and establishment of more yards).

Similar to grazing agreements, most landholders focused on describing the effects of the agreement on land management and health, such as amount of groundcover. However, several did explicitly describe the agreement as improving their capacity to cope with drought, indicating improved self-efficacy and identity in terms of being able to cope with challenges on the farm and maintain achievement of outcomes important to farmers such as maintaining production from grazing while also maintaining groundcover in dry times.

Table 3 Open-ended evaluation of positive and negative aspects of stock management area agreements, and potential changes

Type of comment	Type of impact	No. of participants (n=13)	Examples of quotes
Positive	Improving groundcover and reducing erosion	8	"Able to maintain ground cover" "Better regeneration of pasture when rainfall occurs" "Retained ground cover"
Positive	Improved capacity to cope with low rainfall and drought	6	"Set up for the next drought" "We were able to keep ground cover on paddocks during drought and low rainfall years"
Positive	Improving options for stocking	2	"More livestock keeping options" "Containing young stock securely while introducing onto feed"
Positive	Improved overall productivity	2	"Enabled us to improve productivity" "Allowed to carry increased DSE on block without changing cropping program"
Negative	None	5	
Negative	Dustiness of SMA	1	"Dust while stock were in area"
Negative	High labour time (to establish or manage)	2	"Extensive amount of work requirement to achieve this project" "Increased management feeding livestock"
Negative	Compulsory course not useful	1	"The one day compulsory course to access funds was boring and not helpful"
Change	None	5	
Change	Enable use of yard when not in drought, or establishment of more yards	2	"Allowing participants to use the drought lot for other reasons other than drought e.g temporary keeping of small mobs or sick animals"

Vegetation agreements

Of the 73 landholders who provided written comments on their vegetation agreements, just over twice as many commented on positive outcomes as commented on negative outcomes or suggested changes. The most common comments were that the agreement (Table 4):

- Had positive impacts in the form of increased health, diversity and amount of vegetation (39 landholders)
- Had positive impacts in the form of reduced erosion, usually in riparian areas (25 landholders)
- Had positive impacts in the form of making grazing management easier (11 landholders)
- Had positive impacts in the form of improved fencing, increasing fauna, increasing groundcover, increasing biodiversity in general, increasing bird life, improving weed management (6 to 9 landholders mentioned each)
- Had negative impacts in the form of increased labour needs (14 landholders) and high costs to landholders (10)
- For some, had negative impacts in the form of low survival of plants, difficulty completing works on time, increased difficulty of grazing management, or reduced amount of land for grazing (4 to 6 landholders for each)
- Could be improved by increasing the flexibility and timeframe of project implementation, helping address issues such as needing to plant in unseasonal conditions, and by improving weed and pest control and quality and type of materials used (3 to 6 landholders for each).

Most landholders focused on describing the effects of the agreement on environmental outcomes and land management, and did not comment in these initial open-ended questions on how these changes in land management flowed on to their own life. Even those who described high costs did not go on to describe how these high costs affected their financial wellbeing more broadly. The exceptions were a small number of landholders who directly described experiencing stress, and several who described increased workloads.

Table 4 Open-ended evaluation of positive and negative aspects of vegetation agreements, and potential changes

Type of comment	Type of impact	No. of participants (n=73)	Examples of quotes
Positive	Increase amount, health or diversity of native vegetation	39	"Improvement in the native vegetation (growth of young trees)" "Increased protection and biodiversity of remnant vegetation"
Positive	Reduced erosion (usually of creeks/river banks)	25	"Spectacular results of tree growth and reduction of soil erosion" "Creek banks no longer eroded"
Positive	Improved grazing management (usually due to fencing work, easier mustering, improved paddock rotation due to paddock subdivisions)	11	"Improved paddock subdivision" "More grazing options" "Easier stock mustering" "Springboard for subdivision" "By creating this new subdivision I was able to change my whole management process"
Positive	Improved fencing	9	"Provided fencing between two paddocks"
Positive	Increased fauna in general (non-specific or fauna other than birds)	8	"Creates habitat for native fauna"
Positive	Increased groundcover	8	"Restored ground cover"
Positive	Increased biodiversity values (in general)	7	"Increase in biodiversity, creating a wild space on farm"
Positive	Increased birdlife	7	"Encourage bird life"
Positive	Increased shelter for stock in general and during specific times such as lambing	7	"able to provide shade for stock" "By fencing off [name of area] I am able to save this shelter-belt for lambing time"
Positive	Improved weed management (and in one case, pest control as well)	6	"Removal of boxthorns from a Grey box wooded area"
Positive	Increased vegetation corridor - improved linkage	4	"Increasing the number of trees in a flora and fauna corridor" "extending and further establishing wildlife corridors for fauna and flora in existing yellow and white box areas of the farm"
Positive	Professional assistance from Local Land Services staff	4	"Staff helpful" "The project was well coordinated"
Positive	Funding enabled more rapid completion of work	3	
Positive	Increased beauty/aesthetic quality of landscape	3	"Beautiful landscape to be in"
Positive	Others	1	"Brought landholders or community to work together" "Demand for goods and services generated for local businesses"

Type of comment	Type of impact	No. of participants (n=73)	Examples of quotes
			"Improved moisture retention" "Improved water quality"
Negative	None	18	
Negative	High amount of time required of landholder, including both ongoing management and direct works	14	"labour requirements" "the time commitment" "caused loads of stress because of increased work load" "finding time to do the work"
Negative	High costs to landholder, including some where costs increased between time of applying for grant and actual works	10	"the costs" "costings done by LLS did not allow for cost blowouts due to price increases between time of grant and completion of works"
Negative	Low survival of plants	6	"flooding destroying some of the seedlings" "survival of plants was low"
Negative	Difficulty completing works on time due to weather/difficult terrain and tight schedules	7	"allocation of time to fence and plant so the project could be completed on time" "getting the job done by the sign off date"
Negative	Increased difficulty of grazing management, usually related to difficulty with watering points, moving stock, or stock breaking through fences; some landholders reported needing more watering points installed	5	"areas didn't have water connected therefore grazing management difficult" "movement and watering of stock"
Negative	Difficulty controlling pest animals preventing effective revegetation, particularly kangaroos; pest animals affecting other parts of property	5	"as soon as the areas were destocked kangaroos invaded" "harbour for kangaroos and feral animals" "increased feral animal habitat"
Negative	Reducing amount of land available for grazing	4	"loss of initial grazing income"
Negative	Unsuccessful outcomes due to events such as bushfire, floods, drought	3	"area affected by bushfires since agreement commenced"
Negative	Harder to control weeds	3	"harder to control weeds in fenced areas"
Negative	Poor quality materials or wrong materials, particularly fencing	2	"the materials provided were insufficient and not good quality"
Negative	Increased stress	1	"loads of stress trying to fit extra work load in"
Negative	Others	4	"Increased bushfire risk" "Long time between applying for grant and undertaking works"

Type of comment	Type of impact	No. of participants (n=73)	Examples of quotes
			"Limited amount of funding" "Lack of success addressing erosion"
Changes	None	19	"Pretty happy with the way it worked out"
Changes	More flexibility in how project can be implemented	6	"need to be more flexible" "a 12 month flexibility regarding the seasons"
Changes	Increase funding, including contribution of NRM agency relative to landholder, overall funds available, and funds dedicated to on-ground works	6	"More financial input to make project viable regarding cost and time spent myself"
Changes	Enable works to be undertaken over several years instead of in short time frame, to increase ability of landholder to succeed in revegetation	4	" [run it as] smaller re-vegetation projects over more years instead of trying to complete such a large project in one year" "For us we think 300-400 trees per annum or biannual would be easier to look after even if over a time period"
Changes	Improve fencing and material options to provide longer term outcome e.g. longer term exclusion of grazing. Several referred to a need to use different fencing materials than those that were used	3	"spend a little bit more on materials to ensure the project is ongoing" "Provide watering points so that grazing management is improved" "more money for fencing materials"
Changes	Improve funding for weed and pest control, in both short and long term, to increase success	3	"Need to better understand the ongoing nature of control of noxious weeds. The cost is becoming prohibitive even at record commodity prices there is never enough allocated in the farm budget to keep noxious weeds under control"
Changes	Better preparation e.g. of tree lines, deep ripping	2	
Changes	Improve continuity of funding	2	"Give participants more time to achieve projects"
Changes	Remove areas set aside for vegetation from rateable area	2	"Remove areas that have been returned to native vegetation from the rateable area"
Changes	Others	6	"Allow top barb wire to be used" "Increase advice on plant selection" "Do more headwall erosion control works" "Provide stewardship payments for high conservation value vegetation types" "Incorporate NSF principles to slow water flow" "Improve relevance to farmers"

Quantitative evaluation of effects of NRM agreements on pathways to socio-economic wellbeing

Agreement holders were asked whether the agreements they had entered with Riverina Local Land Services had led to any of a number of social or economic changes, specifically:

- Reduced or increased workload (two survey items)
- Reduced or increased farm profitability (two survey items)
- Reduced or increased overall farm productivity (two survey items)
- Reduced or increased land management costs (e.g. costs of inputs) (two survey items)
- Making land management easier or more complicated (two survey items)
- Reduced or increased stress (two survey items)
- Sense of achievement or pride (one item)
- Sense of frustration or worry (one item)
- Improved ability to cope with drought or other challenges on the land (two survey items)
- Improved health of their land (one item)
- Increased land management knowledge or skills (one item)
- Causing disagreement or bad feelings with others (e.g. neighbours) (one item)
- Making new social connections or networks (one item)
- Improving physical health (e.g. through increasing amount of physical activity or exercise) (one item).

For each item, landholders were asked to rate the extent to which the project had this effect, on a 7-point response scale from 1 (not at all) to 7 (a lot). Each of these items was designed to assess specific pathways to socio-economic wellbeing, focusing on:

- **Identity and self-efficacy**, which can be contributed to by an NRM activity if that activity helps the farmer achieve things that fulfil their identity as a productive farmer who is a steward of the land (sense of achievement, ability to cope with drought or other challenges, changes in land health, skills and knowledge, productivity)
- **Mental and physical health**, which can be contributed to by an NRM activity if it affects levels of stress, worry, complexity of land management, exercise and workload, as well as indirectly by affecting social connections and financial wellbeing
- **Social capital**, which can be contributed to by an NRM activity if it affects the extent of positive social connections or negative social interactions such as disagreements
- **Standard of living**, which will be potentially affected by an NRM activity if it changes farm profitability, productivity, or land management costs.

Landholders were then asked to identity if overall the NRM activity had a negative or positive effect (on a 7-point scale from very negatively [1] to very positively [7] with a rating of 4 indicating a neutral effect) on:

- Your ability to achieve the things you want to on your land (identity and self-efficacy)
- Your finances (financial wellbeing)
- Your security in your future (mental and physical health)
- Your health (mental and physical health)
- Your relationships (social capital)

- Your social connections with people in your community or region (social capital)
- Your life as a whole (overall wellbeing)

Grazing agreements

A majority of the 13 landholders who had entered grazing agreements felt the agreement had (Figure 13) improved the health of their land, made them feel a sense of achievement or pride, made them feel better prepared for challenges on their land, made it easier to manage their land, increased overall farm productivity, and increased land management knowledge or skills. This suggests that the primary ways grazing agreements will impact on socio-economic wellbeing is via the pathway of identity and self-efficacy, with farmers feeling better able to achieve land management and stewardship goals. It also suggests some potential effects on financial wellbeing (via farm productivity) and mental health (via increase ease of land management, better confidence in being able to cope with challenges, and the improvements on self-efficacy and identity). When asked more directly about the effect of the grazing agreement on key wellbeing areas (Figure 14), this was confirmed to a large extent: the majority of landholders who had entered grazing agreements (85%) felt it had a positive impact on their ability to achieve desired outcomes on the land, and on their life as a whole, while most reported a positive impact on their sense of future security. There were, however, a range of views about impacts on finances, with five reporting a negative impact, five a positive impact and three a neutral impact.

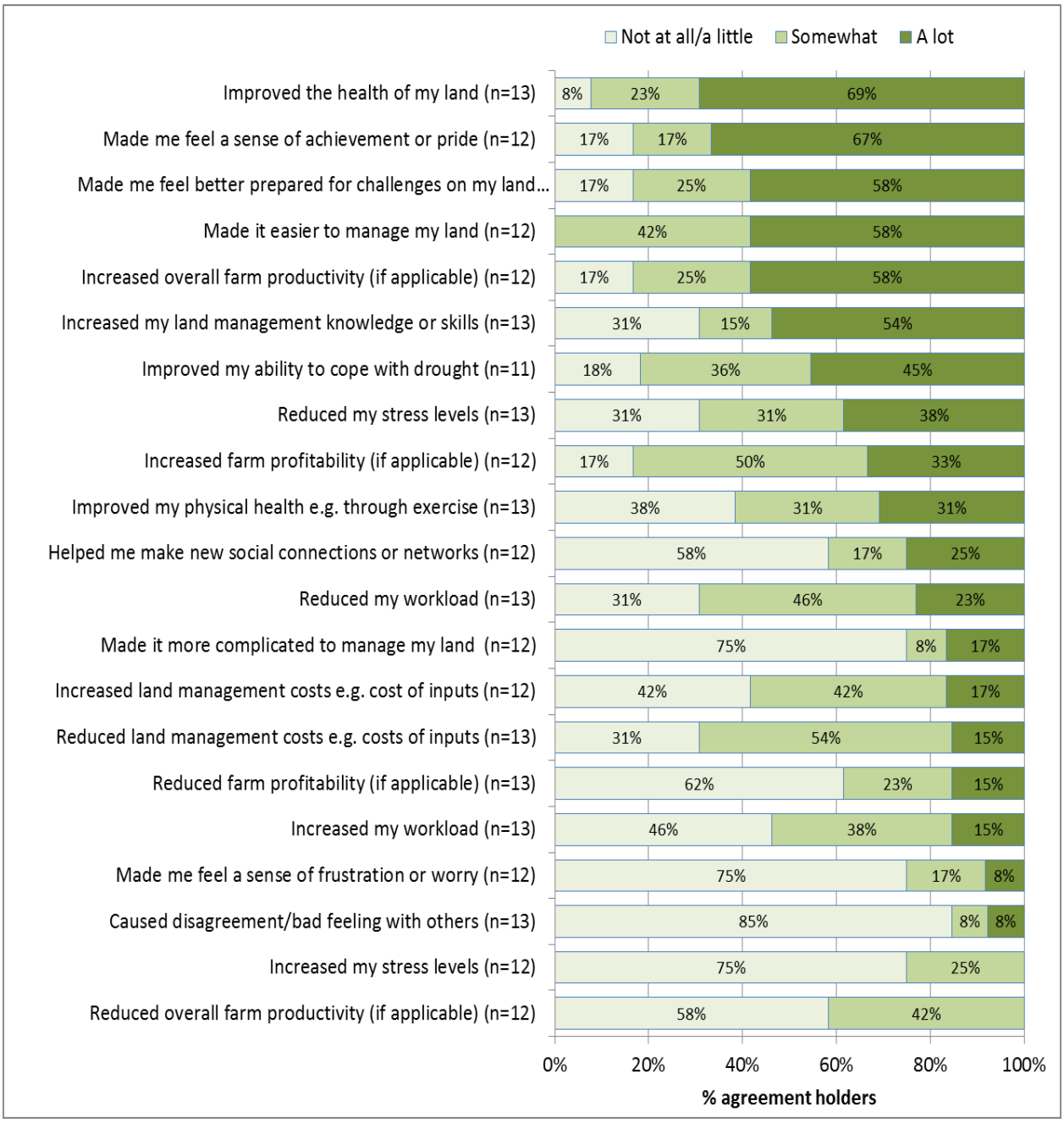


Figure 13 Grazing agreements – specific social and economic effects reported by landholders

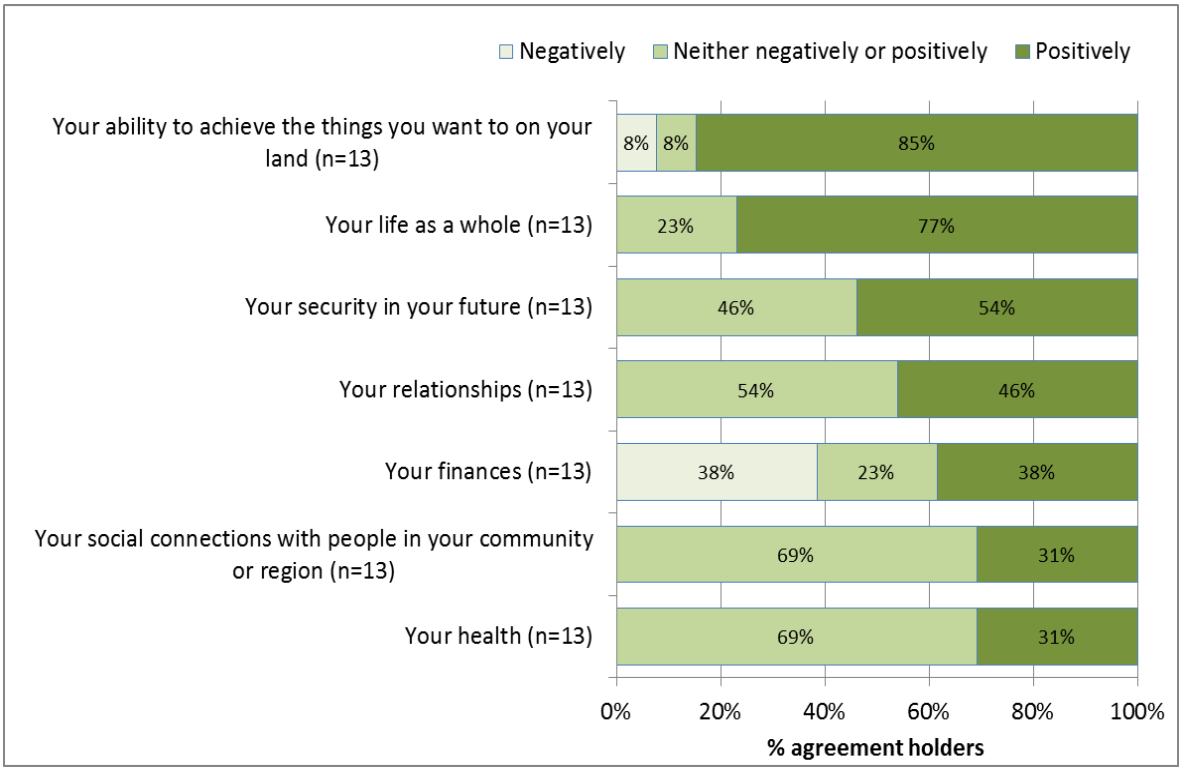


Figure 14 Grazing agreements – overall social and economic effects reported by landholders

Stock management area agreements

A majority of the 13 landholders who evaluated stock management agreements felt the agreement had (Figure 15):

- Improved their ability to cope with drought a lot (92%) or somewhat (8%)
- Made them feel a lot better prepared for challenges on their land (83%)
- Made them feel a sense of achievement or pride (83%)
- Made it easier to manage their land (82%)
- Increased overall farm productivity (80%)
- Improved the health of their land (75%).

A majority also reported there was 'somewhat' or 'a lot' of positive effect on farm profitability, reduction in stress, and reduced workload. A majority reported 'somewhat' of a reduction in land management costs, although many also reported 'somewhat' of an increase. Very few reported any large negative effect on stress levels, farm profitability, or either a negative or positive impact on social capital in the form of increased disagreements or increased social connections.

This suggests that the major pathways by which entering a stock management agreement is likely to impact on farmer wellbeing is via improving self-efficacy and identity, in some cases through improving standard of living. Many may also experience improved mental health via reduced stress, reduced land management complexity, and improved self-efficacy. This was supported by findings of the second set of questions which asked more directly about the ultimate effects on each wellbeing pathway (Figure 16): landholders were most likely to report positive effects on improved future security and improved ability to achieve the things they wanted to on their land, were somewhat more likely to report positive than negative impacts on their finances, and mostly reported neutral or positive overall effects on their life.

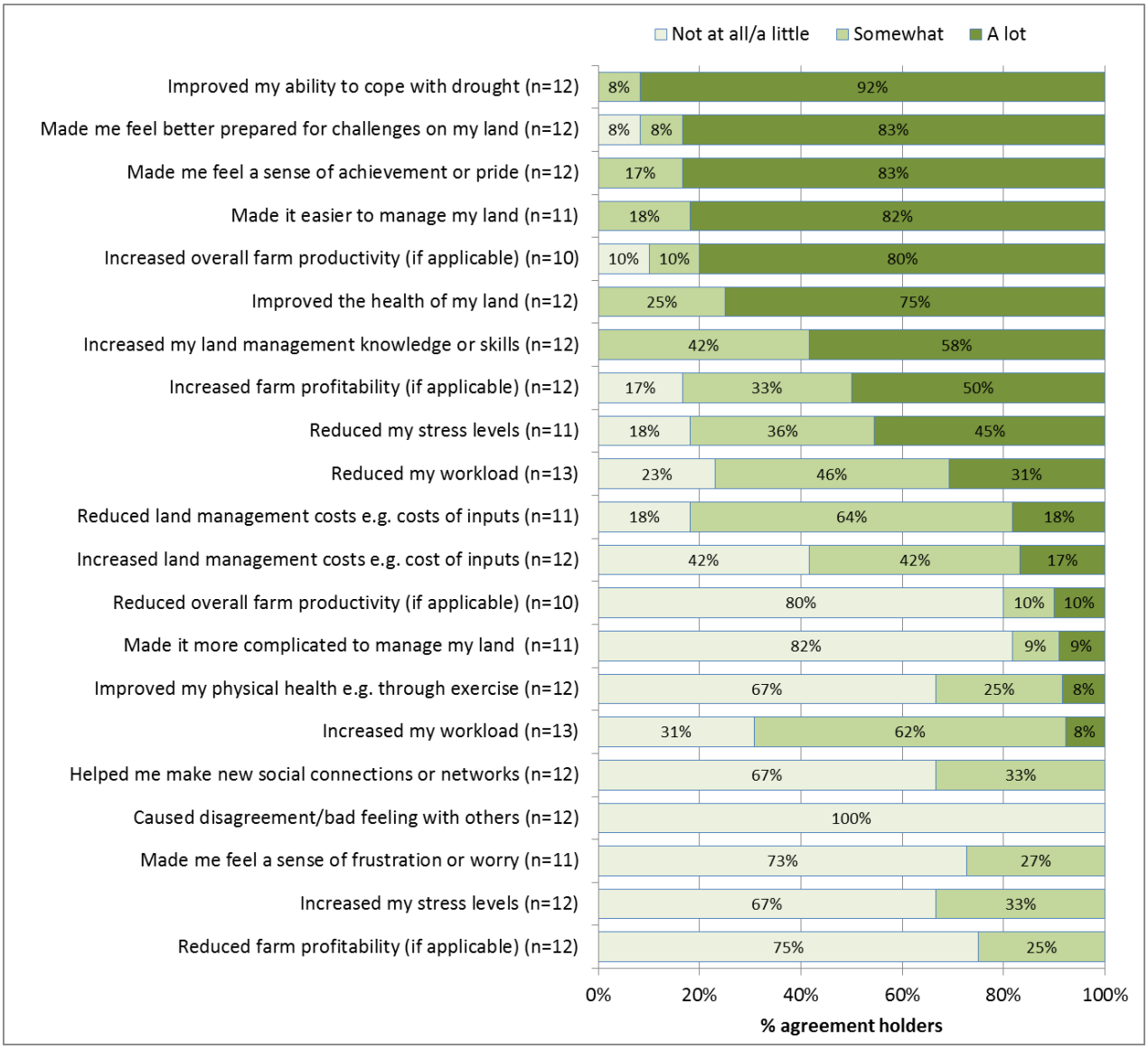


Figure 15 Stock management area agreements – specific social and economic effects reported by landholders

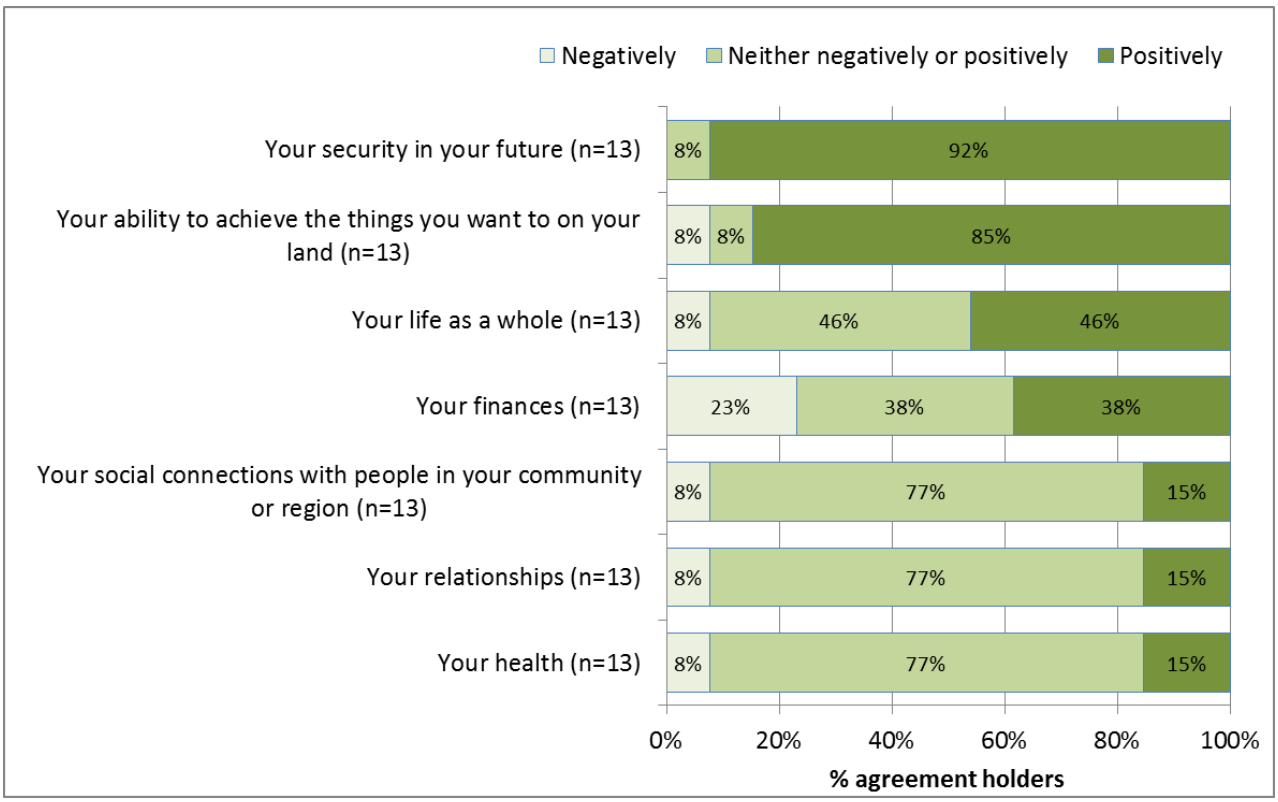


Figure 16 Stock management area agreements – general social and economic effects reported by landholders

Vegetation agreements

A majority of the 82 landholders who provided detailed evaluation of the social and economic effects of entering into a vegetation agreement (Figure 17) reported positive effects on the health of their land, and on their own sense of achievement or pride, while 51% also reported they increased their land management knowledge or skills a lot, and 49% reported finding it easier to manage their land. A substantial proportion – 40% - reported a large increase in their workload. This indicates somewhat different wellbeing pathways are triggered by vegetation agreements compared to grazing and stock management area agreements: in this case, the main pathways are reinforcing farmer identity through achieving stewardship objectives and pride, and increasing self-efficacy through increasing knowledge and skills. This type of agreement is less likely to make landholders feel better prepared for challenges on their land, or to improve farm productivity. This was confirmed in analysis of the direct effects on each wellbeing pathway: 73% of those with vegetation agreements reported a positive effect on their ability to achieve the things they wanted to on their land (Figure 18), and 46% a positive effect on their life as a whole, while none reported a negative impact. Around one third reported improved social connections, relationships, health, or finances, and one quarter reported worse finances as a result of the agreement.

This suggests that even where agreements have negative impacts on finances, most landholders experience neutral or positive wellbeing impacts as a result of entering vegetation agreements, with all evaluating the agreement as either having a neutral impact on their life as a whole (54%) or a positive impact (46%). Experiencing negative impacts on finances did predict an overall 'neutral' rating by the landholder of the effect of the activity on their life overall: in other words, if the landholder reported negative impacts on finances but positive effects on other aspects of their life, they were more likely to report that the overall effects of the NRM activity on their life were neutral rather than that they were positive.

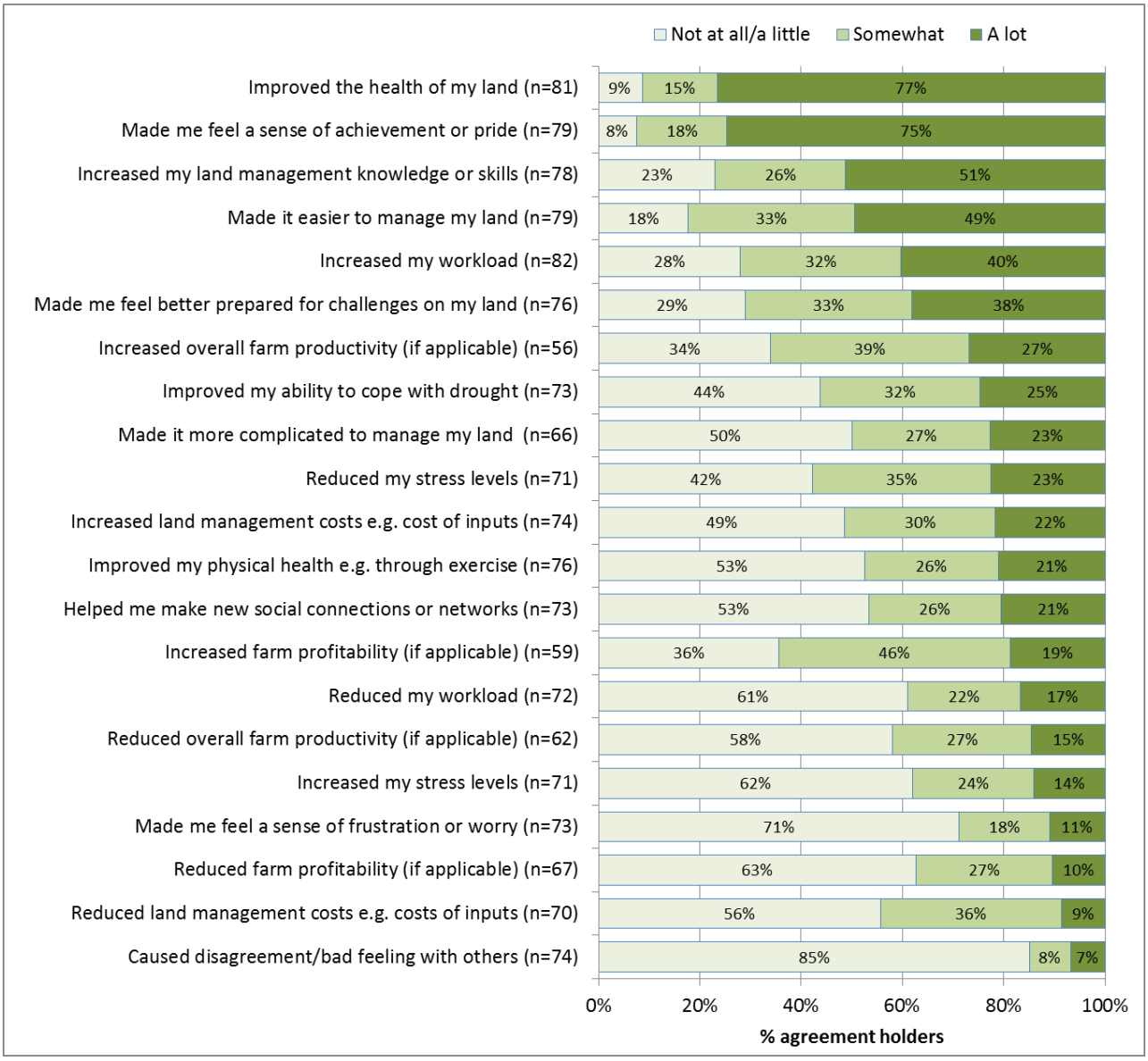


Figure 17 Vegetation agreements – specific social and economic effects reported by landholders

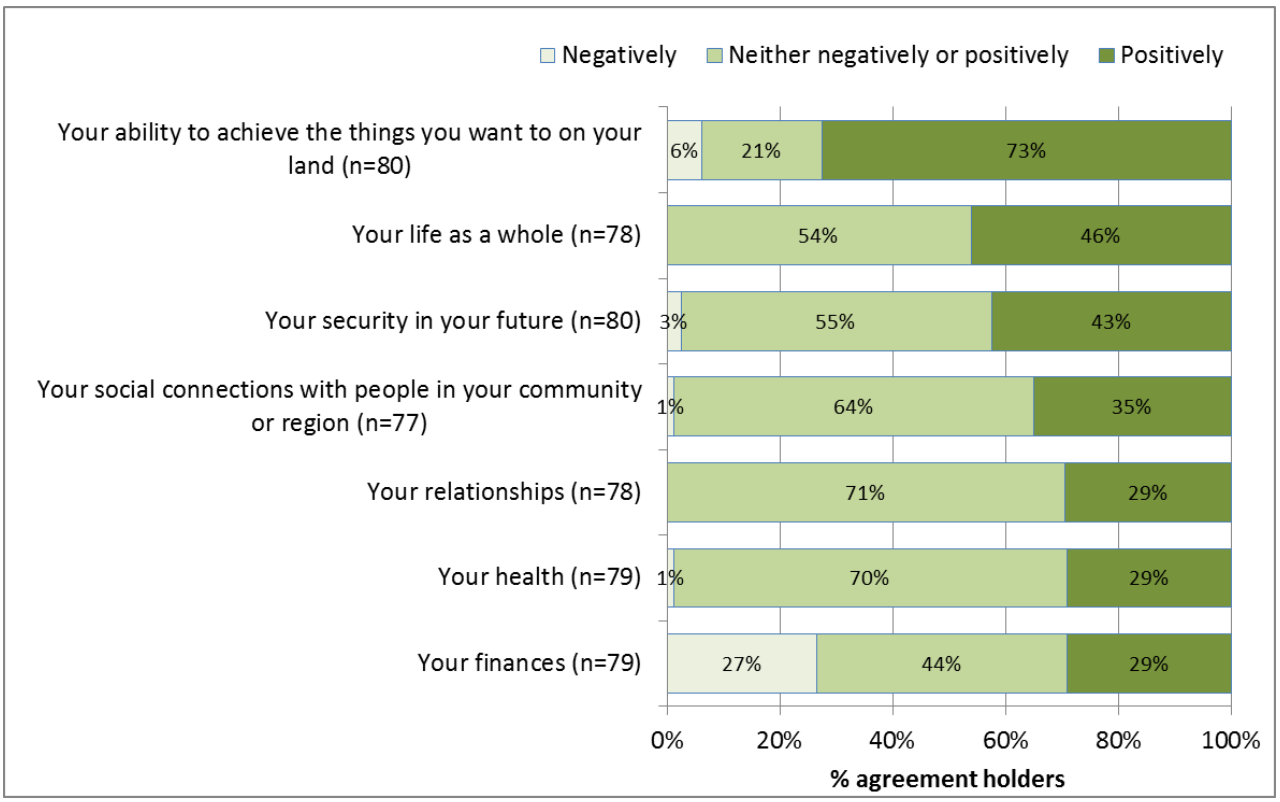


Figure 18 Vegetation agreements – general social and economic effects reported by landholders

Variation in experiences of different landholders

Different types of landholders were compared to identify whether they were more or less likely to report that the NRM agreement they had participated in was neutral or positive for their life overall. As very few landholders (two) reported negative effects of any agreement for their life overall, this group were not included. As shown in Figure 19, there was little variation in views by farmers managing farms of different economic size, but sheep graziers, and to a lesser extent beef graziers, were more likely to report the NRM activity had a positive effect on their life overall than those running mixed grazing and cropping enterprises, or those running mixed grazing enterprises. This suggests a need to better understand how NRM agreements impact complexity of farm management for those who run mixed enterprises versus those who focus on grazing a single type of animal.

Landholders who had engaged in more NRM activities were more likely to report positive outcomes from any one of those activities (Figure 20). This is likely to reflect that landholders are less likely to engage in repeated NRM activities if the first activities do not have positive outcomes for them. There was no difference in reported impacts amongst landholders with no off-farm work, part-time or full-time off-farm work (Figure 20). There was however a difference amongst those who had been engaged in farming for different lengths of time: farmers who had been farming for fewer years were more likely to report positive impacts than those who had been farming for more years.

Women reported slightly more positive effects than men, there were no differences by age (indicating that the differences observed between those who had spent differing time in farming were related to farming skills and knowledge, rather than to age), and there were very few differences amongst landholders with differing levels of formal educational attainment (Figure 21).

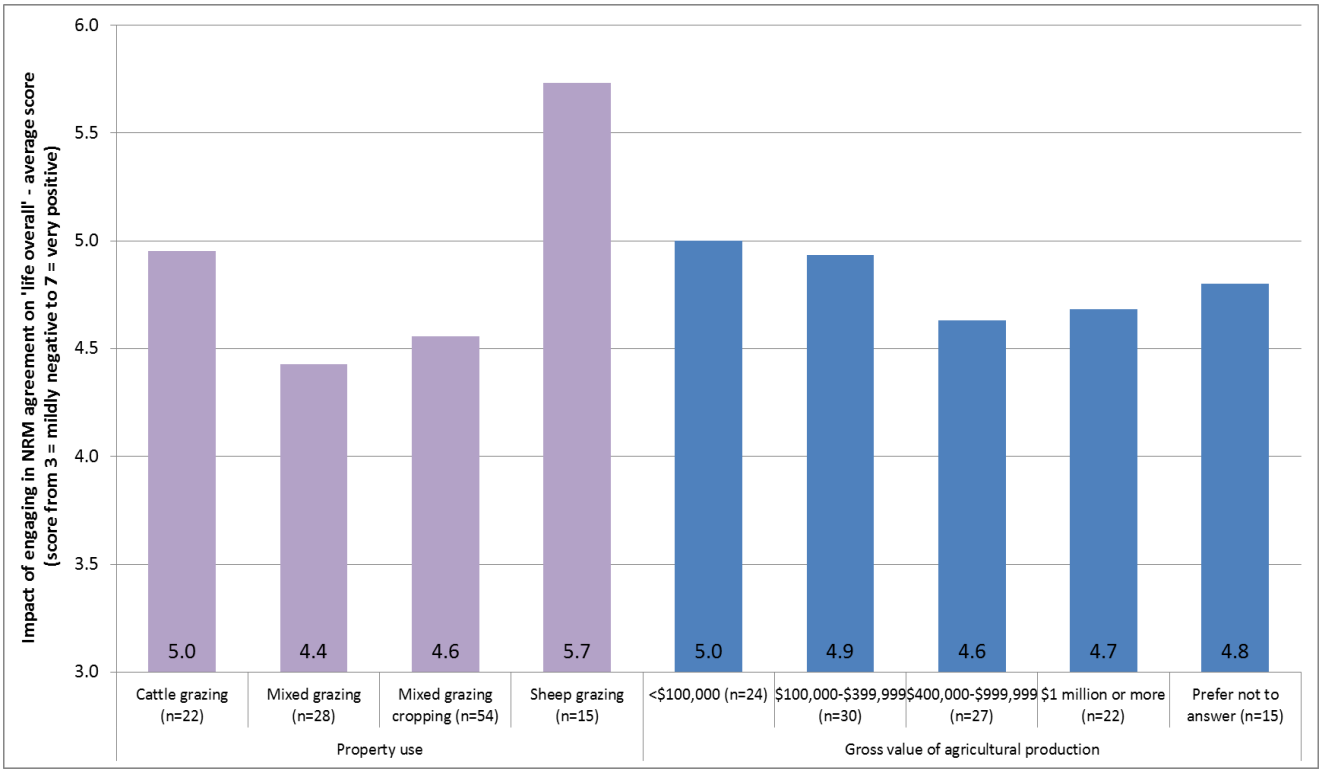


Figure 19 Views of landholders about the effects of NRM agreements on their 'life overall', by farm type and economic size

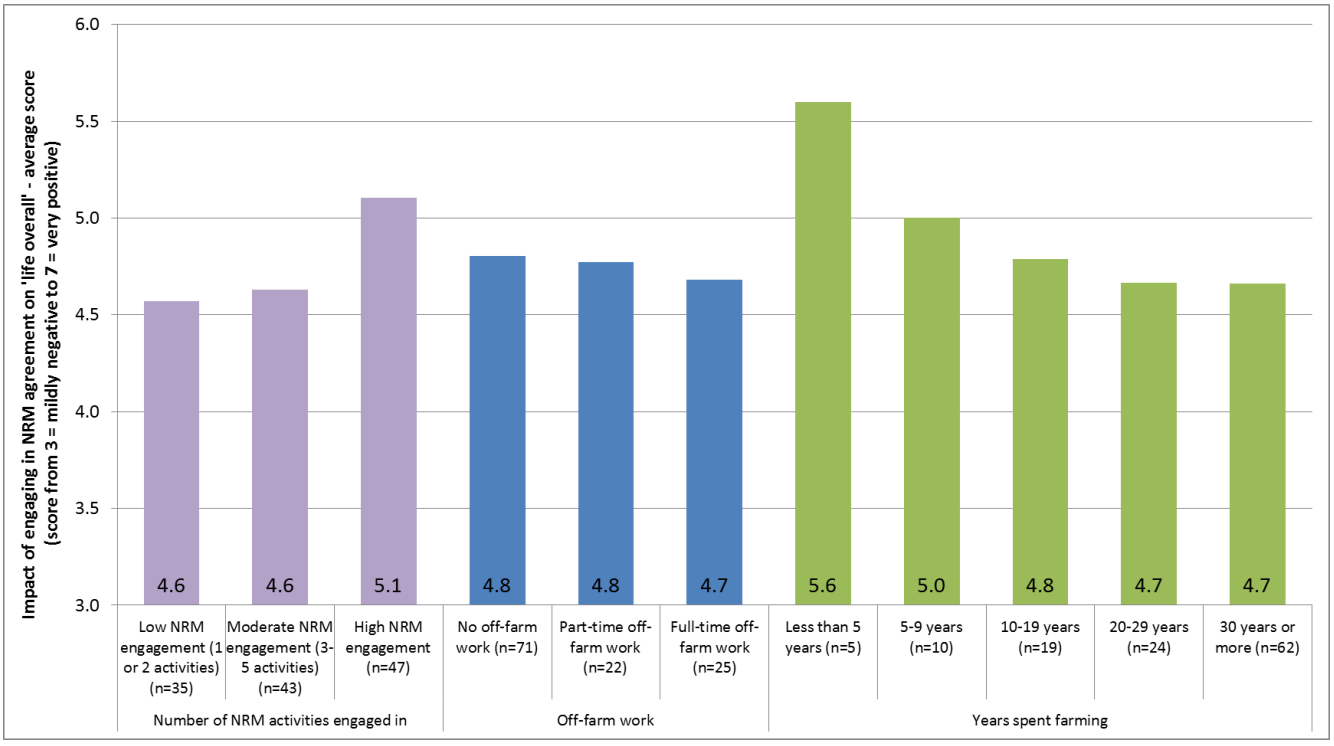


Figure 20 Views of landholders about the effects of NRM agreements on their 'life overall', by NRM engagement, extent of off-farm work, and length of time in farming

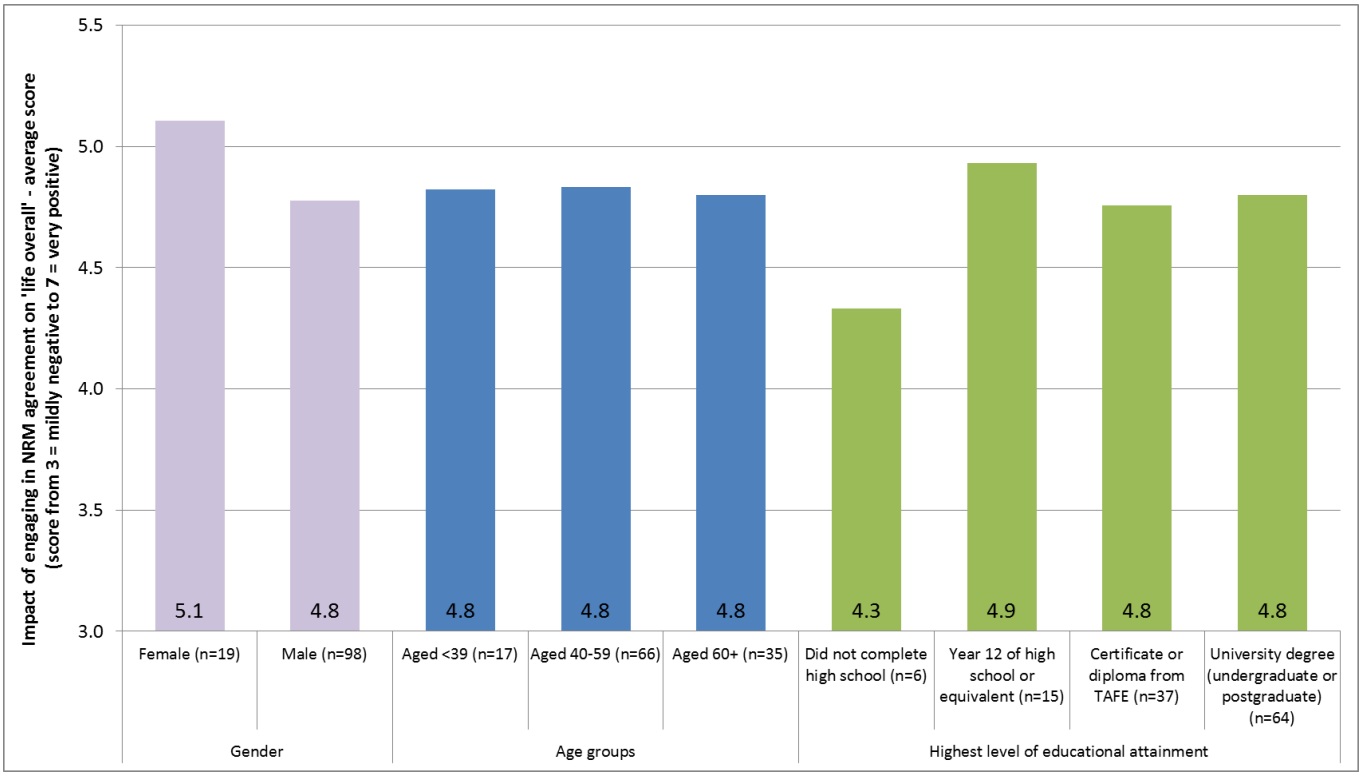


Figure 21 Views of landholders about the effects of NRM agreements on their 'life overall', by gender, age and educational attainment

Effects of NRM agreements on wellbeing – conclusions based on evaluation of specific socio-economic wellbeing pathways

All three types of agreement have predominantly neutral or positive overall effects on wellbeing. In the case of vegetation agreements, improvements in self-efficacy and identity, and in some cases other wellbeing pathways, led 46% of landholders to report a positive impact on their life as a whole, while for 54% the effect of these positive outcomes (in a quarter of cases offset by negative effects on finances) on overall wellbeing ('life as a whole') was neutral. The overall finding was similar for stock management agreements, where improved ability to cope with challenges led to an overall positive impact on wellbeing ('life as a whole') for 46% but for neutral outcomes for many and to negative overall outcomes for one. 'Neutral' overall outcomes were often associated with the NRM activity having positive effects of things like self-efficacy, but also negative impacts on aspects of financial wellbeing. Grazing agreements were associated with more positive overall impacts on wellbeing, with effects on grazing management substantial enough that most landholders rated the overall impact on their life (wellbeing) as positive. The effects of NRM activity appear to be most positive for farmers who manage a grazing enterprise focused on one animal and slightly less positive for those running mixed enterprises; and more positive for those who have spent less time in farming as an occupation, perhaps due to having a greater effect on increasing skills, knowledge and overall self-efficacy amongst those with relatively less experience in farming.

4.5 Overall wellbeing of landholders

The final step in our analysis was examining the overall wellbeing of landholders, and identifying whether the effects of NRM activities on wellbeing is visible when the overall wellbeing of landholders who have engaged in agreements is examined.

This was done by measuring the overall wellbeing of landholders using the wellbeing measures described in the Methods chapter: Global Life Satisfaction (a single measure), and the Personal Wellbeing Index (several measures examining different aspects of a person's wellbeing).

The wellbeing reported by landholders who had engaged in NRM was then analysed by:

- Comparing wellbeing of those who said the NRM activity had *neutral* versus *positive* overall effects on their life. There was not a large enough group of landholders who reported negative overall impacts (two) to analyse their wellbeing compared to others.
- Comparing wellbeing of those who had engaged in NRM to the average wellbeing of Riverina farmers more generally. This was done by drawing on data from the 2016 Regional Wellbeing Survey, described below.

The Regional Wellbeing Survey is an 'omnibus' survey that examines the wellbeing, quality of life and resilience of people living in rural and regional Australia. In 2016, just over 13,000 people completed the survey (predominantly during the month of November), and this included more than 4,000 farmers, of whom 259 lived in the Riverina Local Land Services region. This sample of farmers provides a useful comparison group that can be compared to the sample of farmers who engaged in NRM activities with Riverina Local Land Services. The farmers included in the Regional Wellbeing Survey (RWS) sample include farmers who have and haven't engaged in NRM, and therefore provides a 'population benchmark' level of wellbeing, collected at a point close in time only six months prior to the survey conducted for this project.

When analysing this type of wellbeing data, it is important to first understand the typical level of variance in wellbeing across a given population. Multiple studies, including many in Australia, have shown that at a population level, wellbeing levels are highly stable. Using the 100 point scoring system shown in Figure 22, there is typically less than a 1-2 point variable in wellbeing across years and between regions, and the average level of wellbeing reported by individuals is clustered around the 70-80 score with a large majority of individuals reporting a level of wellbeing within this very small part of the total wellbeing score range of 0-100 (see for example International Wellbeing Group 2013, Schirmer et al. 2016). This means that very small variances in wellbeing scores are typically significant and indicate real differences in wellbeing: even with a small sample, a variance of five points in wellbeing scores is highly likely to indicate a significant difference, and a variance of three to four points is moderately likely to indicate this.

Figure 22 shows overall results of this comparison. The first important finding is that there is a strong difference in overall wellbeing reported by landholders who (i) reported the NRM agreement had a *neutral* effect on their life and (ii) that it had a *positive* effect on their life overall.

Those who reported that entering an NRM agreement had a neutral effect on their life overall typically reported wellbeing very slightly, but not significantly, higher than that of Riverina landholders as a whole, with one exception: while they had similar 'global life satisfaction' (satisfaction with their life as a

whole) to all landholders, they reported poorer standard of living. This is consistent with the earlier finding that the only negative wellbeing pathway associated with NRM agreements is financial wellbeing, with a significant minority of landholders reporting negative impacts on aspects of their financial wellbeing that would in turn have potential impacts on their overall standard of living.

Those who reported that entering an NRM agreement had a positive effect on their life overall, meanwhile, reported moderately to significantly higher wellbeing on several fronts. Their wellbeing was moderately higher than that of the average Riverina landholder for their (i) life as a whole, (ii) personal relationships, (iii) feeling part of their community and (iv) their future security. It was very similar to the average Riverina landholder for standard of living. It was significantly higher than the average Riverina landholder for (i) health, (ii) what landholders were currently achieving in life, and (iii) feeling safe. This is consistent with the wellbeing pathways identified earlier: NRM agreements most commonly had positive impacts on self-efficacy (via improving ability of landholders to achieve desired outcomes on the farm and cope with challenges), and on mental health via both the improvement in self-efficacy and through reinforcing farmer identity in the form of feeling a sense of achievement or pride.

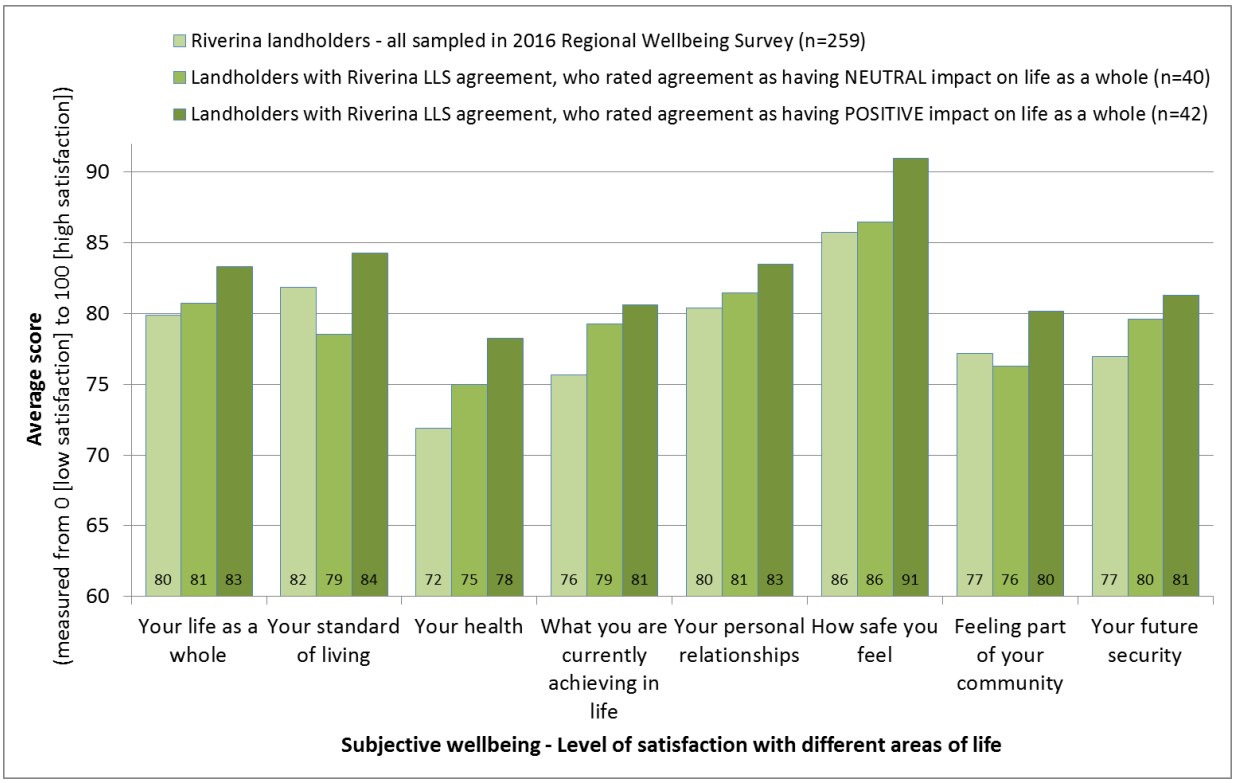


Figure 22 Wellbeing of landholders: comparison of (i) all Riverina landholders and (ii) landholders who had participated in a Riverina Local Land Services agreement

Overall, these results suggest that the wellbeing pathways activated by engaging in NRM agreements are, for those landholders where they are strong enough (indicated by the landholder reporting a positive effect on their life overall), observable as a significantly higher level of overall wellbeing, particularly in the critical areas of mental health and self-efficacy.

5.0 Conclusions

The findings of this project strongly show that engaging in NRM activities with Riverina Local Land Services has a positive effect on the wellbeing of most of the landholders involved. Importantly, it is very rare for landholders to report negative effects on any aspect of wellbeing, with the one exception being their finances, where a significant minority of landholders report some negative impacts. Of landholders who have entered into agreements, around half experience an overall improvement in wellbeing that is observable and significant, while the other half maintain their wellbeing overall.

Most landholders are moderately to highly satisfied with the process and outcomes of engaging in NRM activities run by Riverina Local Land Services. This suggests that effects on wellbeing are generally positive or neutral. When specific wellbeing pathways were examined, engaging in NRM agreements typically had effects on wellbeing via (i) improving self-efficacy, (ii) improving health, and (iii) supporting the identity of farmers (which is strongly associated with both mental health and self-efficacy). Importantly, the effects of different NRM activities vary, reinforcing the importance of understanding the specific 'wellbeing pathways' triggered by differently designed NRM activities. In particular:

- Grazing agreements were most likely to be associated with improved wellbeing, particularly through improving the ability of landholders to reduce land management complexity, reduce labour time, increase sense of achievement, improve productivity and improve ability to cope with challenges such as drought
- Stock management area agreements predominantly led to improved wellbeing through improving ability to cope with challenges and support self-efficacy
- Vegetation agreements were more likely to benefit wellbeing through supporting identity and self-efficacy.

The findings do suggest that landholders with less experience in farming report greater overall benefits from NRM activities. This may be because the advice, knowledge and skills achieved via the NRM activity, as well as benefits of infrastructure investments such as fencing, are greater for farmers who have spent less years in farming. The findings also suggest that NRM activities are less positive for farmers managing more complex mixed enterprises, such as mixed cropping and grazing enterprises, compared to those managing pure grazing enterprises focused on only sheep or only cattle. This suggests a need to consider how to plan NRM activities to benefit farm management on more complex properties as well as on pure grazing enterprises.

The results have some limitations that need consideration. First is that in a cross-sectional survey, causal pathways cannot be formally determined. The approach taken in this report, which clearly identified a likely causal pathway from the NRM activity to effects on wellbeing, provides a useful way of identifying likely causal relationships despite this limitation, and is consistent with approaches recommended in the broader literature (see for example Schirmer 2011). Ideally, in future, an improved approach would involve Local Land Services staff asking landholders to complete a short survey when they are applying for funding or just entering into an agreement, which would include a baseline measure of wellbeing and each of the key wellbeing pathways. This survey could then be repeated after works are completed and over time as the landholders see outcomes from the NRM activities (for example, increased vegetation health, improved groundcover, better ability to cope with drought). This would provide longitudinal data that can be analysed to provide more robust evidence on causal pathways, using the same approach demonstrated in this report.

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Appendix 1 Survey instrument

Evaluation of Riverina natural resource management

This survey has been sent to you as you have participated in one of the natural resource management programs delivered in the last five years by Riverina Local Land Services, Murrumbidgee CMA (prior to 2015 when the CMA was merged into Local Land Services) or Landcare. The survey has four parts:

1. **Your NRM activities:** We ask you to identify which NRM activities you've done in recent years with Riverina Local Land Services, Murrumbidgee CMA or Landcare. *NRM means any activity intended to improve sustainability of land management or environmental health. Examples range from encouraging regeneration of native vegetation to investment in water saving infrastructure and changing fencing to improve ground cover and reduce erosion, to name a few.*
2. **Benefits and costs of NRM activities:** We ask about the benefits and costs participating in these NRM activities had for you, and your ideas for improvement
3. **Your property:** We ask for a little information about the land you manage to help us better understand who has benefited more (and less) from our programs
4. **A bit about you:** We ask for some information about you, to help us better design our future NRM programs to meet the needs of different landholders

Q1.1 Your NRM activities

First we want to find out which Riverina Local Land Services (or Murrumbidgee CMA prior to 2015) and Landcare activities you've been involved in. Please tell us below.

Which of the following have you done?	**Have you done this?**		**What year/years did you do this?** *Select all that apply*						
	Yes	**No**	**Pre-2012**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Entered into an agreement to: - **protect existing vegetation, plant new vegetation, and/or encourage regeneration of vegetation**	○	○	○	○	○	○	○	○	○
Entered into an agreement to: - **change grazing management on my land** *(eg with aim of maintaining specific % groundcover)*	○	○	○	○	○	○	○	○	○
Entered into an agreement to: **- establish a stock management area/drought lot/ confinement feeding area**	○	○	○	○	○	○	○	○	○
Received a grant from Riverina Local Land Services or Murrumbidgee CMA e.g. an Innovation for Irrigation or sustainable agriculture grant	○	○	○	○	○	○	○	○	○
Received a grant from Landcare	○	○	○	○	○	○	○	○	○
Attended a workshop or training course on NRM or sustainable agriculture (*Workshops may have been held in partnership with organisations such as Farmlink, GRDC, BoM, OEH, or the Ricegrowers Association)*	○	○	○	○	○	○	○	○	○
Received one-on-one advice from an LLS or Landcare staff member (in person, or by phone or email)	○	○	○	○	○	○	○	○	○
Attended a paddock walk or paddock demonstration	○	○	○	○	○	○	○	○	○
Attended a Landcare nature walk	○	○	○	○	○	○	○	○	○
Attended a **NRM or Landcare social event** e.g. a public talk or BBQ	○	○	○	○	○	○	○	○	○
Other NRM/Landcare activity, please describe below _____	○	○	○	○	○	○	○	○	○

Q1.2 Agreements entered into with Riverina Local Land Services or Murrumbidgee CMA

If you have ever entered into an agreement with Riverina Local Land Services (or Murrumbidgee CMA prior to 2015) we'd like to know a little more about the agreement/s below. *Please answer for up to two agreements – if you have entered into more than two, please answer for the two that have involved the largest amounts of change on your land. If you have never entered an agreement, please go to the next page.*

Agreement	What did the agreement/s you entered into require you to do on your land? *Select all that apply*	Which activities happened on your land as part of this agreement? *Select all that apply*
Agreement 1	An agreement requiring me to: ◯ **Protect existing vegetation** ◯ **Encourage revegetation** (e.g. planting seedlings, encouraging natural regrowth) ◯ **Change grazing management** on my land e.g. by changing fencing and paddock subdivisions ◯ **Establish a stock management area**/ drought lot/ confinement feeding area ◯ **Increase water use efficiency** e.g. through changing on-farm water infrastructure ◯ **Other agreement**, please describe _____	◯ Fenced off a riparian area (e.g. river or creek bank) ◯ Fenced off vegetation outside a riparian area e.g. paddock trees ◯ Fenced off an erosion area ◯ Changed how property is fenced in other ways ◯ Excluded grazing from an area of land ◯ Changed how grazing is managed in other ways ◯ Encouraged natural regeneration of vegetation ◯ Planted seedlings/direct seeding ◯ Conducted weed control ◯ Conducted pest control ◯ Established a drought lot/confined feeding area ◯ Encouraged improved groundcover retention ◯ Changed on-farm water infrastructure e.g. dams, irrigation ◯ Changed land management e.g. how you make decisions ◯ Other, please describe _____
	Overall, how satisfied are you with the work done & outcomes of the agreement? *Select one*	Not at all satisfied ◯ ◯ ◯ Somewhat satisfied ◯ ◯ ◯ Very satisfied
Agreement 2	An agreement requiring me to: ◯ **Protect existing vegetation** ◯ **Encourage revegetation** (e.g. planting seedlings, encouraging natural regrowth) ◯ **Change grazing management** on my land e.g. by changing fencing and paddock subdivisions ◯ **Establish a stock management area**/ drought lot/ confinement feeding area ◯ **Increase water use efficiency** e.g. through changing on-farm water infrastructure ◯ **Other agreement**, please describe _____	◯ Fenced off a riparian area (e.g. river or creek bank) ◯ Fenced off vegetation outside a riparian area e.g. paddock trees ◯ Fenced off an erosion area ◯ Changed how property is fenced in other ways ◯ Excluded grazing from an area of land ◯ Changed how grazing is managed in other ways ◯ Encouraged natural regeneration of vegetation ◯ Planted seedlings/direct seeding ◯ Conducted weed control ◯ Conducted pest control ◯ Established a drought lot/confined feeding area ◯ Encouraged improved groundcover retention ◯ Changed on-farm water infrastructure e.g. dams, irrigation ◯ Changed land management e.g. how you make decisions ◯ Other, please describe _____
	Overall, how satisfied are you with the work done & outcomes of the agreement? *Select one*	Not at all satisfied ◯ ◯ ◯ Somewhat satisfied ◯ ◯ ◯ Very satisfied

Q1.3 Workshops or training courses you have attended

If you have attended workshops or training courses with Riverina Local Land Services (or Murrumbidgee CMA prior to 2015), or Landcare, **we'd like to know a little more about the topic of the workshops/training courses.** *If you have attended more than one workshop/training course, please answer for up to three - please select the three that were most important for you. If you have never attended a workshop/training course on NRM or sustainable agriculture, please go to Q1.4 below.*

What were the main topics covered at the workshop? *Select all that apply*	**Workshop/ training course 1**	**Workshop/ training course 2**	**Workshop/ training course 3**
Plant identification	◯	◯	◯
Threatened species (e.g. squirrel gliders, mallee fowl, bitterns, glossy black cockatoo)	◯	◯	◯
Weed management/noxious weeds	◯	◯	◯
Pest animal control (rabbits/pigs/foxes)	◯	◯	◯
Crop nutrition/fertiliser	◯	◯	◯
Soil health workshop	◯	◯	◯
Grazing management workshop (e.g. PROgraze)	◯	◯	◯
Stubble management workshop	◯	◯	◯
Animal health workshop (e.g. footrot, lice etc)	◯	◯	◯
Compliance with NLIS workshop	◯	◯	◯
Use of technology e.g. drones	◯	◯	◯
Cultural values workshop	◯	◯	◯
Monitoring and evaluating remnant bush	◯	◯	◯
Farmer health and wellbeing	◯	◯	◯
Workshop on other topic/s, please describe _____	◯	◯	◯

Overall, how satisfied were you with each workshop/training course? *Select one*	**Not at all satisfied**			**Somewhat satisfied**			**Very satisfied**
Workshop/training course 1	◯	◯	◯	◯	◯	◯	◯
Workshop/training course 2	◯	◯	◯	◯	◯	◯	◯
Workshop/training course 3	◯	◯	◯	◯	◯	◯	◯

Q1.4 Advice you have received

If you have received advice in person, by email or phone from staff at Riverina Local Land Services (Murrumbidgee CMA prior to 2015) or Landcare, **we'd like to know a little more about the type of advice received.** *Please answer for the advice that has been most important for you.*

Advice	**What type of advice did you receive**
What year/s did you get advice?	Year/s:
What type of advice did you receive?	Topics:
Did you get advice in person, by email, or on the phone? *Select all that apply*	◯ In person ◯ By email ◯ On the phone
Overall, how satisfied were you with the advice? *Select one*	Not at all satisfied ◯ ◯ ◯ Somewhat satisfied ◯ ◯ ◯ Very satisfied ◯

2. Benefits and costs of NRM, sustainable agriculture and Landcare activities

This section asks you to evaluate the benefits & costs of up to two of the NRM/Landcare/sustainable agriculture projects or activities you have participated in. If you have done more than two, please evaluate the two most important to you.

2.1 Evaluation of NRM/sustainable agriculture/Landcare project or activity 1

Write the name of the NRM, sustainable agriculture or Landcare activity you participated in below.

Name of project/activity 1: _____

e.g. 'Agreement with Local Land Services for revegetation; Workshop on soil health; Extension advice on grazing management; Landcare grant for fencing riparian area'

Overall, what were the POSITIVE effects of this project or activity?	
Overall, what were the NEGATIVE effects and CHALLENGES of this project or activity?	
What changes would you recommend making to this project /activity in future?	

Overall, project/activity 1…	**Not at all** ①	②	③	④	⑤	⑥	**A lot** ⑦
Reduced my workload	○	○	○	○	○	○	○
Increased my workload	○	○	○	○	○	○	○
Reduced farm profitability (if applicable)	○	○	○	○	○	○	○
Increased farm profitability (if applicable)	○	○	○	○	○	○	○
Reduced overall farm productivity (if applicable)	○	○	○	○	○	○	○
Increased overall farm productivity (if applicable)	○	○	○	○	○	○	○
Reduced land management costs e.g. costs of inputs	○	○	○	○	○	○	○
Increased land management costs e.g. cost of inputs	○	○	○	○	○	○	○
Made it easier to manage my land	○	○	○	○	○	○	○
Made it more complicated to manage my land	○	○	○	○	○	○	○
Increased my stress levels	○	○	○	○	○	○	○
Reduced my stress levels	○	○	○	○	○	○	○
Made me feel a sense of achievement or pride	○	○	○	○	○	○	○
Made me feel a sense of frustration or worry	○	○	○	○	○	○	○
Improved my ability to cope with drought	○	○	○	○	○	○	○
Made me feel better prepared for challenges on my land	○	○	○	○	○	○	○
Improved the health of my land	○	○	○	○	○	○	○
Increased my land management knowledge or skills	○	○	○	○	○	○	○
Caused disagreement or bad feelings with others e.g. neighbours	○	○	○	○	○	○	○
Helped me make new social connections or networks	○	○	○	○	○	○	○
Improved my physical health e.g. through exercise	○	○	○	○	○	○	○

Overall, how did project/activity 1 affect…	Very NEGATIVELY			No CHANGE			Very POSITIVELY
	①	②	③	④	⑤	⑥	⑦
Your ability to achieve the things you want to on your land	○	○	○	○	○	○	○
Your finances	○	○	○	○	○	○	○
Your security in your future	○	○	○	○	○	○	○
Your health	○	○	○	○	○	○	○
Your relationships	○	○	○	○	○	○	○
Your social connections with people in your community or region	○	○	○	○	○	○	○
Your life as a whole	○	○	○	○	○	○	○

If you have a second activity you are able to evaluate, please answer Question 2.2. Others, please go to Question 3.

2.2 Evaluation of NRM/sustainable agriculture/Landcare project or activity 2

Write the name of the NRM, sustainable agriculture or Landcare activity you participated in below.

Name of project/activity 2: _____

e.g. 'Agreement with Local Land Services for revegetation; Workshop on soil health; Extension advice on grazing management; Landcare grant for fencing riparian area'

Overall, what were the POSITIVE effects of this project or activity?	
Overall, what were the NEGATIVE effects and CHALLENGES of this project or activity?	
What changes would you recommend making to this project/ activity in future?	

Overall, project/activity 2….	Not at all ①	②	③	④	⑤	⑥	A lot ⑦
Reduced my workload	○	○	○	○	○	○	○
Increased my workload	○	○	○	○	○	○	○
Reduced farm profitability (if applicable)	○	○	○	○	○	○	○
Increased farm profitability (if applicable)	○	○	○	○	○	○	○
Reduced overall farm productivity (if applicable)	○	○	○	○	○	○	○
Increased overall farm productivity (if applicable)	○	○	○	○	○	○	○
Reduced land management costs e.g. costs of inputs	○	○	○	○	○	○	○
Increased land management costs e.g. cost of inputs	○	○	○	○	○	○	○
Made it easier to manage my land	○	○	○	○	○	○	○
Made it more complicated to manage my land	○	○	○	○	○	○	○
Increased my stress levels	○	○	○	○	○	○	○
Reduced my stress levels	○	○	○	○	○	○	○
Made me feel a sense of achievement or pride	○	○	○	○	○	○	○
Made me feel a sense of frustration or worry	○	○	○	○	○	○	○
Improved my ability to cope with drought	○	○	○	○	○	○	○
Made me feel better prepared for challenges on my land	○	○	○	○	○	○	○
Improved the health of my land	○	○	○	○	○	○	○
Increased my land management knowledge or skills	○	○	○	○	○	○	○
Caused disagreement or bad feelings with others e.g. neighbours	○	○	○	○	○	○	○
Helped me make new social connections or networks	○	○	○	○	○	○	○
Improved my physical health e.g. through exercise	○	○	○	○	○	○	○

Overall, how did project/activity 2 affect…	Very NEGATIVELY ①	②	③	No CHANGE ④	⑤	⑥	Very POSITIVELY ⑦
Your ability to achieve the things you want to on your land	○	○	○	○	○	○	○
Your finances	○	○	○	○	○	○	○
Your security in your future	○	○	○	○	○	○	○
Your health	○	○	○	○	○	○	○
Your relationships	○	○	○	○	○	○	○
Your social connections with people in your community or region	○	○	○	○	○	○	○
Your life as a whole	○	○	○	○	○	○	○

3. Your land

This section asks a few questions about the land you manage, to help us understand whether the services delivered by Riverina LLS are working better (or less well) for some types of properties than others.

3.1 Your property

How many years have you managed your property (if you have more than one property, please answer for the one most of your NRM activity has occurred on) *Select one*	◯ Less than 5 years ◯ 5-9 years ◯ 10-19 years	◯ 20-29 years ◯ 30 years or more
What area of land do you manage? *Management means you are helping make decisions about how the land will be used, often with a spouse or business partner*	Land you own or part-own: *This includes mortgaged land* _____ hectares Land you manage but don't own/part-own: _____ hectares	
What is your property used for (if you manage multiple properties, please answer for those that NRM activities have occurred on) *Select all that apply*	☐ Residence – you live there ☐ Sheep grazing ☐ Cattle grazing ☐ Legume, grain or oilseed crop growing e.g. maize, wheat, barley, canola, soybeans ☐ Cotton growing	☐ Rice growing ☐ Wine grape growing ☐ Fruit growing other than grapes ☐ Vegetable growing ☐ Other (please describe below) _____

3.2 Your farm

If your land is used for agriculture, please answer the following. Otherwise please go to the next page.

How many years have you been a farmer, or been involved in managing a farm? *Select one*	◯ Less than 5 years ◯ 5-9 years ◯ 10-19 years	◯ 20-29 years ◯ 30 years or more
For the period July 1 2015 to June 30 2016 what was your <u>gross value of agricultural production</u>? Your gross value of agricultural production is the total value of sales before costs, also called gross earnings. Please estimate if you do not yet know your precise turnover.	◯ Negative or nil ◯ <$50,000 ◯ $50,000-$99,999 ◯ $100,000-$199,999 ◯ $200,000-$299,999 ◯ $300,000-$399,999	◯ $400,000-$499,999 ◯ $500,000-$749,999 ◯ $750,000-$999,999 ◯ $1 million to $1.99 million ◯ $2 million or more ◯ Prefer not to answer
How much <u>off-farm</u> work do <u>YOU</u> do? *Select one*	◯ No off-farm work ◯ Part-time off-farm work ◯ Full-time off-farm work	
How much <u>off-farm</u> work does your <u>partner/spouse</u> do (if relevant)? *Select one*	◯ No off-farm work ◯ Part-time off-farm work ◯ Full-time off-farm work	
Are you an irrigator or dryland farmer? *Select all that apply*	☐ I irrigate all or part of my land ☐ I am a dryland farmer on part/all of the land I manage	

4. A bit about you

This last section of the survey asks for a bit of information about you. This helps us understand whether the services delivered by Riverina LLS are working better (or less well) for some types of landholders than others.

4.1 You and your household

Do you identify as… *Select one*	◯ Female ◯ Male ◯ Other or prefer not to answer
How old are you?	Years: _____
Are you of Aboriginal or Torres Strait Islander origin? *Select all that apply*	◯ No ☐ Yes, Aboriginal ☐ Yes, Torres Strait Islander
How many people live in your household?	Total number of people, including yourself: _____ Number of children aged under 15: _____
Have you completed any of the following formal qualifications? *Select **ALL** that apply*	☐ Year 12 of high school or equivalent ☐ Certificate or diploma from TAFE ☐ University degree (undergraduate or postgraduate) ◯ None of these
Given your current needs and financial responsibilities, would you say that you and your family are... *Select one*	◯ Very poor ◯ Reasonably comfortable ◯ Poor ◯ Very comfortable ◯ Just getting along ◯ Prosperous

4.2 Your health and wellbeing

It can be hard to take part in NRM activities if your health or wellbeing are poor. To help us better understand how we can support landholders, the final two questions on the survey ask a bit about your health and wellbeing.

How would you rate your general health? *Select one*				
◯ Excellent	◯ Very good	◯ Good	◯ Fair	◯ Poor

Thinking about your own life and personal circumstances, how satisfied are you with the following?	**Completely DISSATISFIED** ⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	**Completely SATISFIED** ⑩
Your life as a whole	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Your standard of living	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Your health	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
What you are currently achieving in life	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Your personal relationships	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
How safe you feel	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Feeling part of your community	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Your future security	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Thank you for completing the survey.

If you would like to be sent a summary of results, please provide your name and email or postal address below. *You do not have to provide these details; if you do provide them these details will be stored separately to your survey response.*

Name: _____

Email or postal address: _____