Australian Government

National Land & Water Resources Audit

# Social and economic information

## Status of information for reporting against indicators under the National Natural Resource Management Monitoring and Evaluation Framework

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# About the National Land & Water Resources Audit

The National Land & Water Resources Audit ('the Audit') provides data, information and nationwide assessments of Australia's land, water and biological resources to support sustainable development. It is an initiative of the Natural Heritage Trust. It commenced in 1997 and published detailed assessment reports in 2002.

The Audit (2003–08) has six key areas of activity:

- developing a consistent national reporting mechanism for collating natural resource information collected under the National Natural Resource Management Monitoring and Evaluation Framework
- collating information to support the national State of the Environment (SoE) reports
- developing nationally consistent, but regionally relevant integrated resource condition reports
- facilitating reporting on the ongoing collection of natural resource information for key theme areas, including those related to the National Natural Resource Management Monitoring and Evaluation Framework
- reporting on national data and information management (in collaboration with ANZLIC – the Spatial Information Council)
- developing national resource assessments (as requested) and supporting program evaluations.

For further information, see http://www.nlwra.gov.au

**The Audit's mission**

To provide data, information and nationwide assessments of Australia's land, water and biological resources to support sustainable development.

# Social and economic information

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The Commonwealth accepts no responsibility for the accuracy or the completeness of any material contained in this report and recommends that users exercise their own skill and care with respect to its use.

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# Foreword

Effective management of natural resources requires good quality data and information at the right level of detail to be available for those who need it. Australia invests significant resources each year in the collection and maintenance of data to inform natural resource management (NRM) decisions.

Since 1997, the National Land & Water Resources Audit has played a vital role in the national coordination, collation and reporting of this information. The Audit collaborates with a range of partners, including the Australian Government, state and territory governments, regional NRM bodies, industry, the private sector and community organisations.

This booklet is part of a series that describes the status of data and information relevant to national indicators agreed under the National Natural Resource Management Monitoring and Evaluation Framework. It specifically reports on the status of information relating to indicators of 'community and social processes relevant to, or affected by, NRM programs, as well as measures of the adoption of sustainable development and production techniques'.

Clarifying the current status of social and economic data and information is a vital step to inform strategic investment in data infrastructure.

The Social and Economic National Coordination Committee (SENCC) has been established — a multijurisdictional forum for providing advice on the development and implementation of national indicators and ensuing collection and reporting. SENCC has been sponsored by the Department of Agriculture, Fisheries and Forestry.

Noteworthy advances in social and economic data infrastructure catalysed by the Audit include:

- development of a cross-disciplinary conceptual framework to underpin the identification and testing of indicators
- agreement on national social and economic indicators for NRM
- filling of key data gaps by the documentation of existing datasets and the funding of new national collections
- establishment of national baselines and the development of new reporting products, including the Signposts for Australian Agriculture report
- significant progress on national information systems and associated standards
- incorporation of national social and economic indicators into monitoring and evaluation arrangements for future programs under the Natural Resource Management Monitoring, Evaluation, Reporting and Improvement (MERI) Framework.

Geoff Gorrie
Chair, Audit Advisory Council

# Acronyms and abbreviations

| | |
|---|---|
| ABARE | Australian Bureau of Agricultural and Resource Economics |
| ABS | Australian Bureau of Statistics |
| BRS | Bureau of Rural Sciences |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| MERI Framework | Monitoring, Evaluation, Reporting and Improvement Framework |
| National M&E Framework | National Natural Resource Management Monitoring and Evaluation Framework |
| NRM | natural resource management |
| SENCC | Social and Economic National Coordination Committee |
| Signposts | Signposts for Australian Agriculture |
| the Audit | National Land & Water Resources Audit |

# Contents

# Executive summary

The National Land & Water Resources Audit (the Audit) and its partners have made substantial progress on social and economic information for natural resource management (NRM) since 2001.

Nationally consistent social and economic information is required to manage Australia's natural resources. This information places people 'in the landscape' — enabling decision makers to link information on the extent and condition of natural resources with their environmental, economic and social values, and with the industries and individuals managing them.

The level of adoption of sustainable management practices can also be linked with:

- the capacity of resource managers to change and associated costs and benefits
- the impact of government, industry and regional initiatives.

This booklet summarises current ability to report on the agreed indicators under the National Natural Resource Management Monitoring and Evaluation Framework (the National M&E Framework) and the Monitoring, Evaluation, Reporting and Improvement Framework.

Some of the key achievements of the Audit's social and economic projects are highlighted in this booklet. Major achievements include:

- the development of cross-disciplinary conceptual frameworks to underpin the identification and testing of social and economic indicators
- agreement on national social and economic indicators for NRM programs
- the filling of key data gaps, by identifying existing datasets, leveraging change to national collections or the funding of new collections
- the establishment of national baselines and development of new reporting products and the incorporation of the national social and economic indicators into monitoring and evaluation arrangements for future NRM programs
- the establishment of the Social and Economic National Coordination Committee (SENCC) — a multijurisdictional forum for providing advice on national indicators, and associated collections and reports, sponsored by the Australian Government Department of Agriculture, Fisheries and Forestry.

The national social and economic indicators have been coordinated with the Signposts for Australian Agriculture program. This in turn has delivered a successful partnership between government and key agricultural industries, a framework and forum for progressing discussions on society's desired outcomes, together with credible information tools and assessments to underpin those discussions.

# Introduction

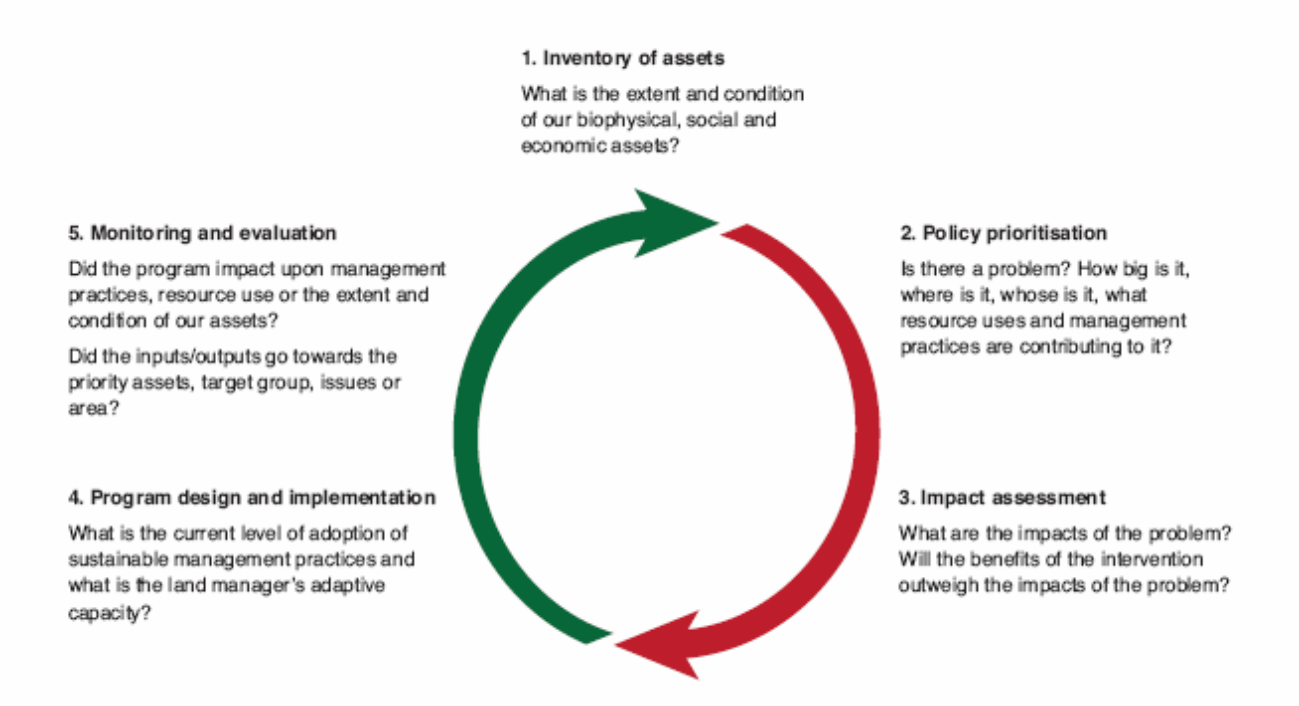
This booklet summarises current capacity to report on 'community and social processes relevant to, or affected by, natural resource management (NRM) programs, as well as measures of the adoption of sustainable development and production techniques' as required by the National Natural Resource Management Monitoring and Evaluation Framework (National M&E Framework) (see Appendix 1 for more information about the framework).

Nationally consistent social and economic information is critical to better management of Australia's natural resources. Social and economic information can be used to place people 'in the landscape' — enabling decision makers to link information on the extent and condition of natural resources with the environmental, economic and social values placed on them by society, industry and the individuals managing the resources. This includes links between the:

- level of resource use and the types of management practices employed
- capacity of resource managers to change and adopt sustainable management practices
- type of government and industry initiatives in place, the reach of those initiatives and their impact on resource managers and natural resources.

Figure 1 illustrates the key questions asked by NRM policy makers and the respective contributions of Signposts for Australian Agriculture (Signposts) (red arrow) and the national social and economic indicators (green arrow).

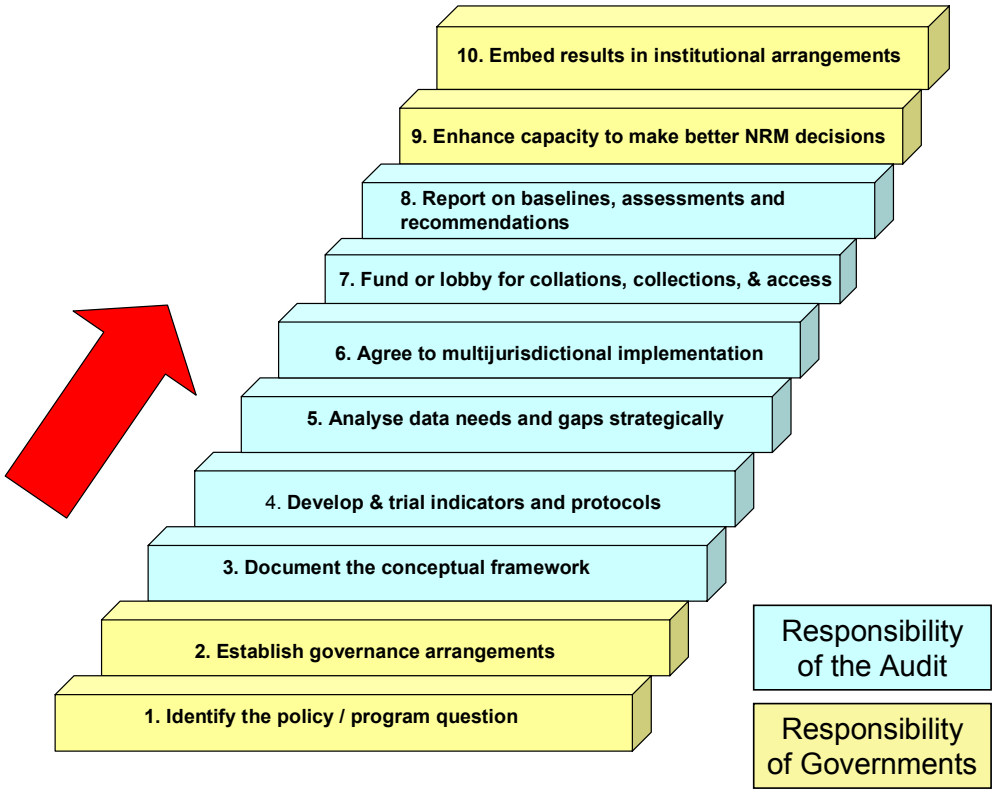
**Figure 1 Common policy questions asked by natural resource management decision makers**



# National coordination

The National Land and Water Resources Audit (the Audit) works with a series of national coordination committees to progress the development and implementation of indicators and information products. As illustrated in Figure 2, the establishment of relevant, timely and accurate information for NRM decisions relies on a number of other activities and partners. The Audit has responsibility for the steps in blue and governments have responsibility for the remaining steps.

**Figure 2 Steps to providing information for natural resource management decision making**




The effective and efficient supply of biophysical information also requires these steps; however, the operating context for social and economic information differs because:

- it has a more diverse range of users (government, industry, non-NRM)
- data-users are often generalists with limited capacity to stipulate information needs and associated collection standards
- information has to be tailored to the evaluation questions of the day and, therefore, depends on the presence of an explicit monitoring and evaluation framework and operational plan.

This need for information will only increase under future programs. There will be a greater emphasis on the use of social and economic information in documenting achievements, and there will be a wider range of delivery agents under Caring for Our Country. Caring for our Country is the Australian Government's funding initiative to invest in the conservation and management of Australia's natural resource assets: its land, water, native plants and animals.

The goal of Caring for our Country is to have an environment that is healthy, better protected, well managed, resilient, and that provides essential ecosystem services in a changed climate.

Funding is focused on achieving strategic results by investing in six national priority areas:

- a national reserve system
- biodiversity and natural icons
- coastal environments and critical aquatic habitats
- sustainable farm practices
- NRM in remote and northern Australia
- community skills, knowledge and engagement.

Adding to the complexity, social and economic information is provided by a range of public and private providers from disparate domains (eg social sciences, economics, marketing) with a history of competitive behaviour.

These factors will affect the level of resourcing and the type of initiatives required to facilitate national data coordination, communication and engagement.

Social and economic information is coordinated by the Social and Economic National Coordination Committee (SENCC). This committee is sponsored by the Australian Government Department of Agriculture, Fisheries and Forestry, and each of the states and territories is represented (Table 1).

**Table 1 Agencies represented on the Social and Economic National Coordination Committee**

| Jurisdiction | Agency |
|---|---|
| ACT | Environment ACT |
| NSW | Department of Environment and Climate Change |
| NT | Natural Resources, Environment and the Arts |
| Qld | Department of Natural Resources and Water |
| SA | Department of Primary Industries and Resources |
| Tas | Department of Primary Industries and Water |
| Vic | Department of Sustainability and Environment |
| WA | Department of Agriculture and Food |
| Australian Government | Department of Agriculture, Fisheries and Forestry<br>Department of the Environment, Water, Heritage and the Arts |
| National | National Land & Water Resources Audit |

Major national data providers have observer status at SENCC, including the Australian Bureau of Statistics (ABS), Australian Bureau of Agricultural and Resource Economics (ABARE), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Bureau of Rural Sciences (BRS) and Land and Water Australia (LWA).

SENCC meets at least three times a year to focus on the following issues:

- coordination and partnerships
- standards and indicators
- data infrastructure and systems
- trials and testing of indicators and collection methodologies
- communication and products
- analysis and assessments.

A full version of SENCC's terms of reference is available at the Audit's website.[1]

Although SENCC was only established in 2005, the committee has already been able to make advances in all of the focus areas. In particular, SENCC has facilitated the development of a community of practice across jurisdictions to work on the social aspects of NRM. Other benefits of SENCC[2] have included improvements in:

- data flow nationally, and between states, territories and regions
- innovation in socioeconomic indicators, methodologies and conceptual frameworks
- awareness and knowledge of socioeconomic aspects of NRM across jurisdictions
- alignment of regional, state and territory activities with the national indicator framework and collection methodologies
- coordination amongst agencies
- boosting the return on investment for projects under the Audit's social and economic projects
- enabling individual regions to fund activities that complement and extend national applications
- leverage by Australian Government and state and territory agencies on national collections
- funding continuity via staggered investment from multiple-program areas.

However, to meet future social and economic information needs for NRM programs, further coordination is required. A recent assessment of access, management and coordination arrangements for state and territory social and economic data sources (KPMG 2008) found that:

- there is unlikely to be a large number of datasets to support the indicators, with significant utilisation of national collections (ABS and ABARE)
- data reside in a more diverse range of organisations than found for biophysical data
- access to data is constrained due to low awareness, and concerns about public sensitivity and commercial confidentiality
- coordination and management in the NRM context is less mature in its arrangements than data management arrangements for the biophysical sciences, with most data sets retained internally and only a small number available on the internet.

Although all jurisdictions have a node on the Australian Spatial Data Directory (ASDD) and are either using or moving to adopt the new ANZLIC[3] Metadata Profile (Version 1.1), there are still few metadata records on the ASDD or in spatial directories or databases dealing with social and economic data. Despite strong acknowledgment of the importance of capturing metadata, there is large variation in the extent to which agencies are resourced and mandated to do so.

Future coordination activities may need to broaden the membership of SENCC. Industry organisations, such as research and development corporations, are large holders of social and economic data, particularly on the adoption of management practices. Similarly, local government and regional NRM bodies may hold socioeconomic data collected during surveys and other data collection activities. Currently, no mechanisms to coordinate government, regional and industry data collections on NRM, either via SENCC or Signposts are in place.

# Conceptual frameworks

The conceptual frameworks underpinning the national social and economic indicators focus on the 'community and social processes relevant to, or affected by, NRM programs, as well as measures of the

[1] http://www.nlwra.gov.au/Natural_Resource_Topics/Socio-economic/index.aspx
[2] SENCC meeting February 2008 and subsequent comments by SENCC members
[3] ANZLIC = the Spatial Information Council

adoption of sustainable development and production techniques' as required under the National M&E Framework.

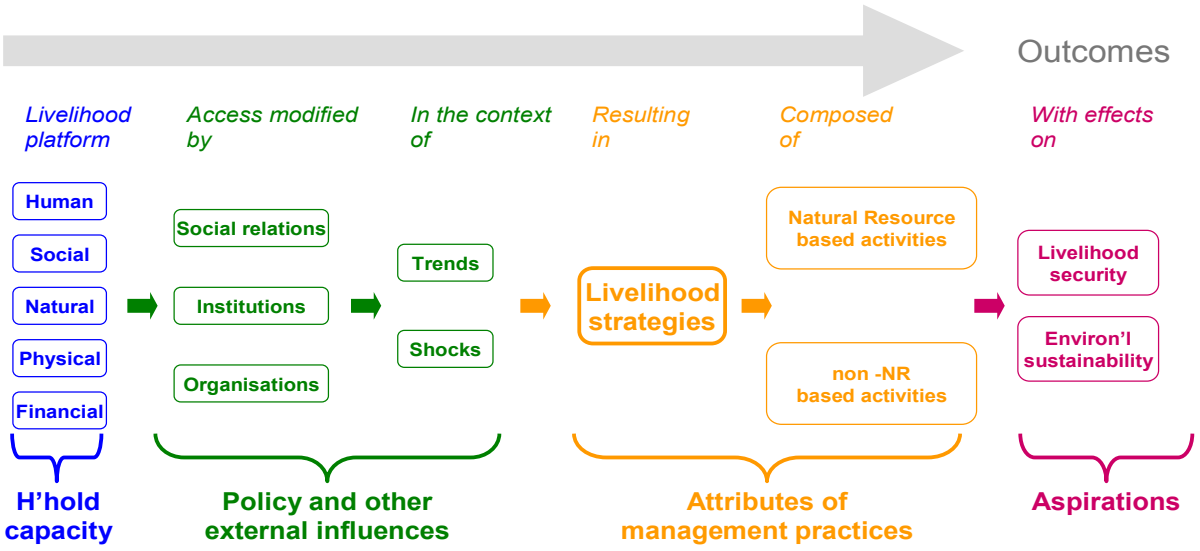
The framework sets out intermediate outcomes to be achieved for three major target groups of NRM programs:

- private resource managers (Nelson et al 2005)
- regional NRM bodies (Fenton and Rickert 2006)
- the broader rural community (Burnside 2007a).

## Capacity of resource managers and adoption of sustainable management practices

Figure 3 illustrates a conceptual framework pertaining to decision-making behaviour of private resource managers. It links the adoption of sustainable management practices with resource manager aspirations and access to human, social, natural, physical and financial capital. The framework illustrates how external influences, such as regional NRM bodies and rural communities, can influence the practices of resource managers by modifying their access to capital (and therefore their capacity to change and adopt alternative practices).

**Figure 3** **A conceptual framework — adaptive capacity of resource managers and the adoption of sustainable management practices**




Source: Ellis (2000)

## Capacity, engagement, partnerships and recognition underpinning NRM delivery

The Signposts framework aggregates the outcomes of individual farmers and their families into industry outcomes. Under this framework, the level of adoption of management practices at the individual farm level and the associated outcomes are linked conceptually with the overall economic, social and environmental contributions of the industry to society.

The indicators pertaining to regional NRM bodies are predicated upon the assumption that the impact of the initiatives delivered by regional NRM bodies to resource managers will be enhanced via quality engagement, effective partnerships and high capacity.

These assumptions and associated measures were developed through consultative workshops with Australian Government, state and regional representatives (Fenton 2006), and underpin the Monitoring, Evaluation, Reporting and Improvement Framework (MERI) Program Logic.

Engagement is assessed in terms of the sufficiency of opportunities for engagement, as well as the scale, quality and effectiveness of engagement processes that do take place.

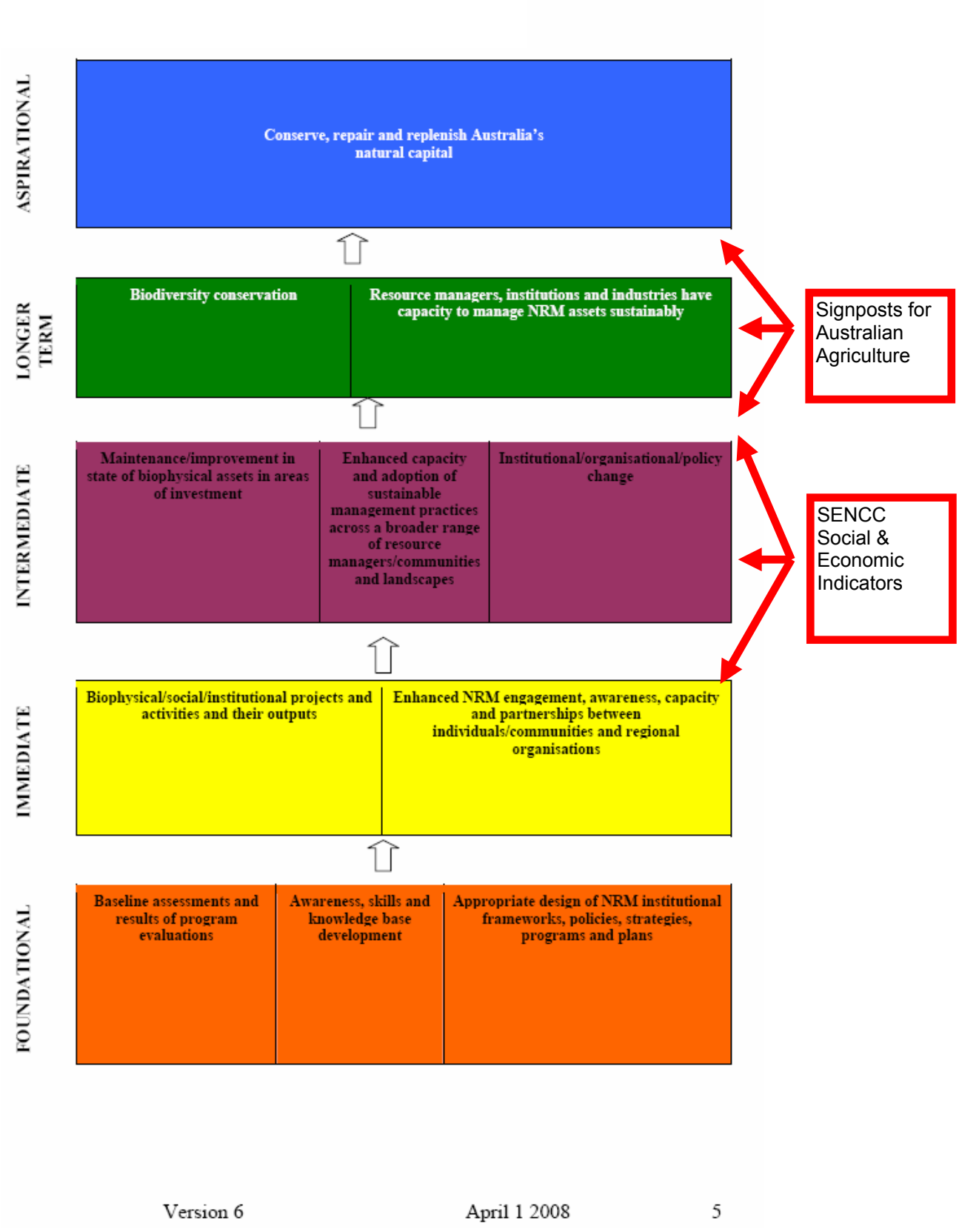
The quality of the partnerships between regional NRM bodies and state, territory and Australian Government agencies is assessed in terms of levels of trust, transparency in decision making and flexibility in negotiation.

The capacity of regional NRM bodies is assessed in terms of:

- decision making and governance — whether there has been an increase in the effectiveness of decision-making structures, including composition, governance structures and systems
- capacity and support — whether there has been an increase in the capacity of regional NRM bodies to meet their responsibilities
- resource characteristics — whether regional NRM bodies have adequate resources (human, financial and information) and institutional arrangements to meet their responsibilities.

Figure 4 illustrates the relationship between the national social and economic indicators for regional NRM bodies and resource managers, and Signposts, against the NRM program logic. National social and economic indicators and Signposts facilitate the assessment of the immediate, intermediate, long-term and aspirational outcomes of NRM programs such as Caring for Our Country.

**Figure 4** **Relationship between the national social and economic indicators, the Signposts for Australian Agriculture Framework and the Monitoring, Evaluation, Reporting and Improvement Framework program logic**



The MERI Framework sets out program logic such that the achievement of identified intermediate outcomes demonstrates that a program or project is likely to be on track towards achieving long-term outcomes. The MERI Framework has biophysical, social, economic and institutional outcomes at all levels of the program logic.

### Community vitality, viability and health

The MERI Framework is an evidence-based conceptual framework developed to clarify concepts and terminology for the relationship between changing resource condition and community vitality, viability and health. Good vitality, viability and health mean better capacity to contribute to the achievement of NRM outcomes. The framework draws upon existing knowledge of human behaviour in managing natural resources, in regional and local development and in community dynamics, and is linked to NRM program logic (Burnside 2007a).

The results of a scoping study identified a range of potential indicator sets and future partnership opportunities to advance reporting on community capacity with regional economic development agencies (Burnside 2007b).

Potential indicators were identified under the following broad areas: those related to enabling regional communities, and those related to motivating regional communities. Various 'heading' and supporting indicators were proposed.

Development and trialling of the indicators and associated methods will occur once multijurisdictional agreement, funding and policies are in place.

## National indicators

Improvements in the extent and condition of land, water and biological resources rely on human interventions at the individual, organisational, community and institutional scale — this is the premise that drives the social and economic indicators. Under the Audit's social and economic projects, two groups of stakeholders were prioritised for the development of socioeconomic indicators: resource managers and regional NRM bodies. Development of indicators relating to the broader rural community has been subject to changes in NRM policy; hence only a scoping study has been conducted.

### Capacity of resource managers and adoption of sustainable management practices

In August 2006, SENCC recommended a national set of indicators and protocols to assist in assessing the impact of NRM programs on the capacity of land managers to change and the adoption of sustainable management practices. These indicators were recommended by the Audit Advisory Council for national implementation in October 2006.

The indicators (Byron et al 2006) focus on the:

- aspirations of land managers (eg the priorities and long-term objectives for managers' property and business)
- capacity of land managers (ie access to capital)
- attributes of NRM practices (eg compatibility with farming systems, observability, the degree to which an innovation can be experimented with on a limited basis)
- external influences on adoption (eg drought, commodity prices)
- level of adoption of sustainable management practices and their economic, social and environmental outcomes.

As a group, the indicators can be used to identify key factors affecting the level of adoption of sustainable management practices. The indicators relating to the capacity of land managers are particularly relevant to policy and program activities, as they can be used to identify priority initiatives or resources to promote adoption. Within this context, the capacity of land managers is defined (Nelson et al 2007) in terms of access to:

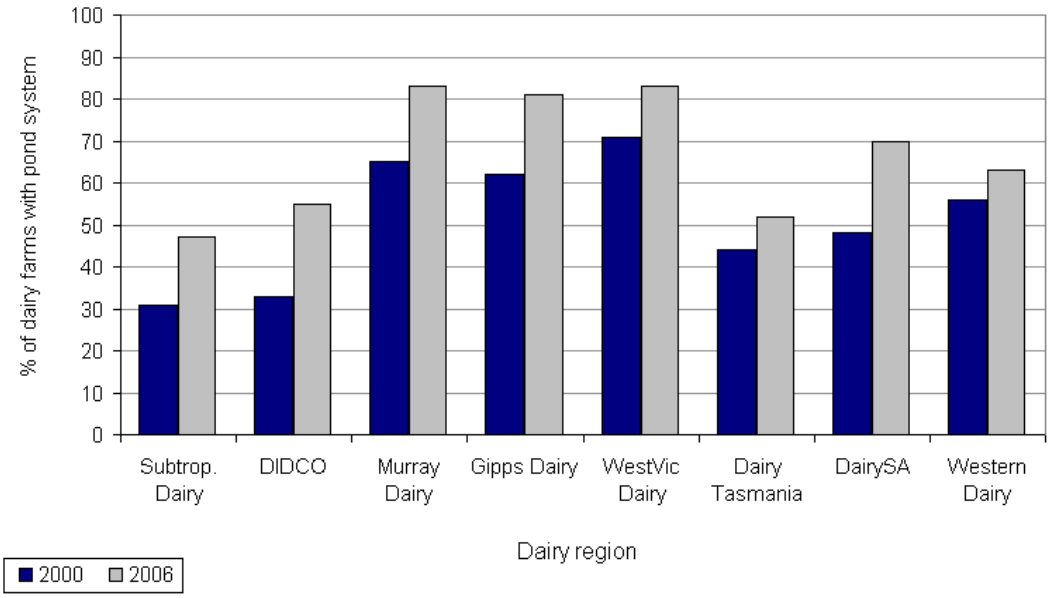
- human capital — skills, health and education of individuals that contribute to the productivity of labour and the ability to manage land
- social capital — reciprocal claims on others by virtue of social relationships, the close social bonds that facilitate cooperative action and the social bridging and linking via which ideas and resources are accessed
- natural capital — productivity of land and actions to sustain productivity, as well as the water and biological resources from which rural livelihoods are derived
- physical capital — capital items produced from economic activity from other types of capital, which can include infrastructure, equipment and improvements in genetic resources (crops, livestock)
- financial capital — level, variability and diversity of income sources, and access to other financial resources (credit and savings) that together contribute to monetary wealth.

The complete set of indicators is directly relevant to the proposed program logic for current and future NRM programs, and can be used to assess the achievement of immediate, intermediate and long-term NRM outcomes. They can be used at a national scale and can also be used to assess the level of adoption of specific farming practices in particular industries and regions (Nelson et al 2004, Hodges and Goesch 2006). An important caveat to this use is that the design and interpretation of national surveys, which assess the level of adoption of management practices, need to be tailored to the:

- regional or industry NRM priorities and practices being targeted
- farming systems of interest
- local nomenclature for a practice (names given to the same practice can vary among regions and industries).

Figure 5 illustrates how these data can be used to track longitudinal changes in the level of adoption of specific practices (in this case, the use of pond systems to manage effluent produced by dairy farms).

**Figure 5** **Percentage of dairy farms with pond systems for managing milking-shed effluent by dairy region (2000 and 2006)**




Source: Signposts for Australian Agriculture

Ultimately, however, the interpretation of trends relies on knowledge of the regional and industry operating context, as rates of adoption may:

- stabilise with saturation of potential adoptors
- decrease as practices are superseded by new technologies, or
- increase with the introduction of government or market-based incentives.

The design and evaluation of government programs can be facilitated by analysing measures of the level of adoption of specific management practices alongside measures of resource manager adaptive capacity. This can be done effectively by:

- identifying the types of capital that are associated with the adoption of sustainable management practices
- assessing the relationship between the adoption of sustainable management practices and participation in NRM programs (Table 2)
- identifying the types of capital provided by NRM initiatives that are most associated with adoption.

**Table 2 Association between the adoption of sustainable management practices and natural resource management initiatives**

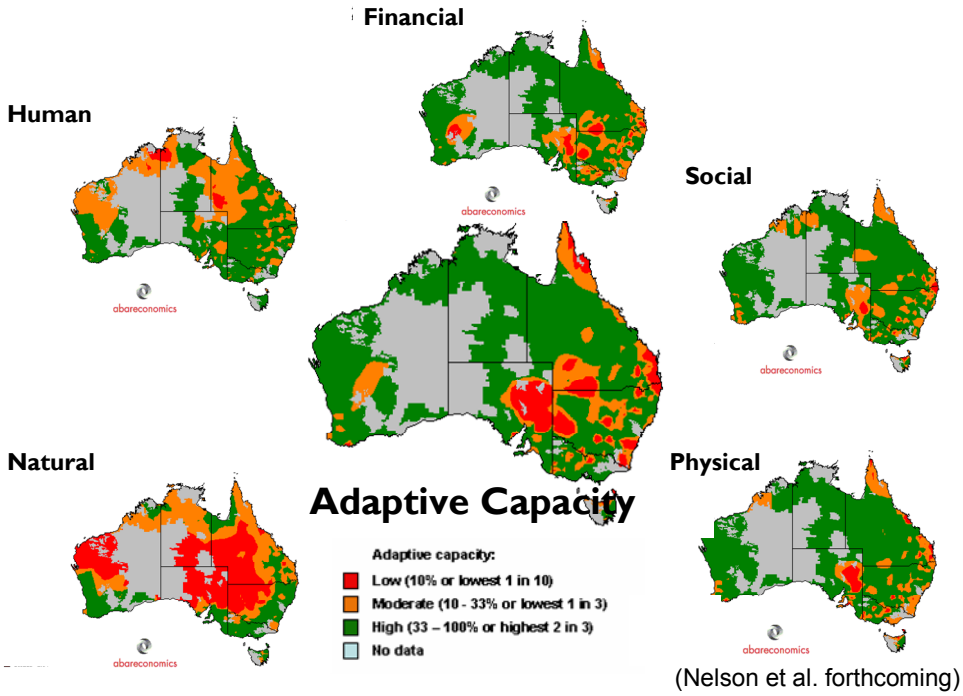
| | % participants (relative standard error) | % nonparticipants (relative standard error) |
|---|---|---|
| All farms: | | |
| • establish and maintain trees or shrubs | 74 (3) | 50 (5) |
| • preserve or enhance areas of conservation value | 64 (4) | 40 (7) |
| • monitor pasture and vegetation condition formally | 30 (8) | 22 (12) |
| • maintain vegetative cover along drainage lines | 77 (3) | 57 (4) |
| • exclude stock from areas affected by land degradation | 71 (3) | 40 (7) |
| • use other practices to control/prevent land and water degradation | 11 (17) | 6 (28) |
| Farms in the wheat–sheep and high-rainfall zones: | | |
| • conduct soil or plant tissue tests | 79 (4) | 55 (6) |
| • monitor watertables regularly | 33 (12) | 11 (18) |
| • incorporate crop or pasture legumes into rotation | 68 (5) | 53 (7) |
| • using contour banks in dryland cropping | 33 (8) | 19 (15) |
| • use strip cropping | 7 (26) | 3 (39) |
| • establish deep-rooted perennial pasture species | 54 (6) | 38 (9) |

Notes:
Farms are only included where each practice is relevant.
Includes participants in the National Landcare Program, Natural Heritage Trust initiatives, National Action Plan and Landcare or similar groups.
Data may total more than 100% because more than one type of cultivation method can be used on a farm.
Source: Nelson et al (2004)

The indicators may be used for policy prioritisation. Spatial representations of the level of adoption of specific practices may be used to refine estimates of risk based on the proximity of biophysical assets, or divergences between land use and land capability. Such risk estimates can then be used to inform the frequency and intensity of follow-up social or biophysical surveys. For example, the level of adoption of industry best practice could be used to direct water quality sampling activities to areas of greatest risk in a catchment.

In the longer term, indicators pertaining to 'access to capital' could be used to assess resource managers' overall ability to respond to the challenges of an uncertain future, including NRM, structural adjustment and climate change. The indicators could then be used to prioritise the delivery of capacity-building activities to resource managers in industries and regions most likely to benefit. Figures 6 and 7 provide examples of where access to the individual components of capital can be mapped against the incidence of biophysical, economic and social drivers of change. Such maps can be used to identify appropriate capacity-building activities (Nelson et al 2005).

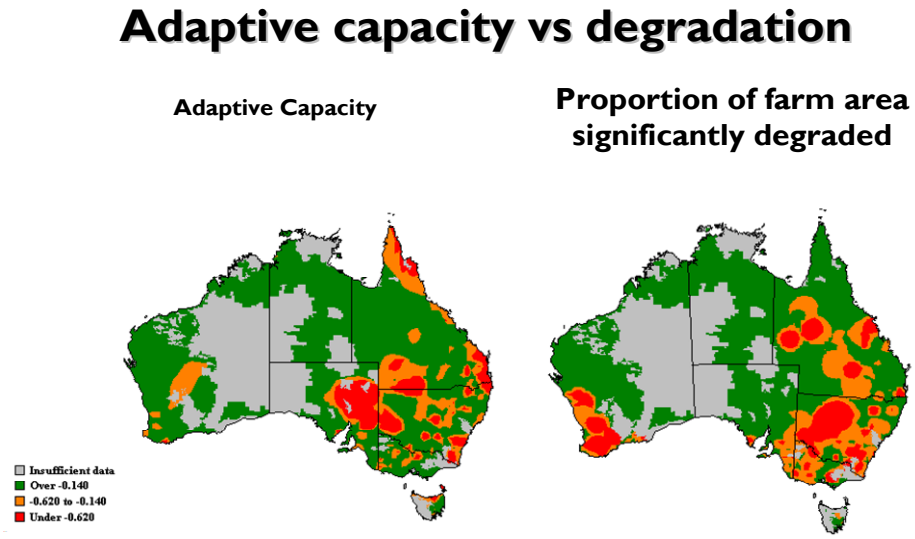
**Figure 6** **Adaptive capacity expressed as an index of access to different forms of capital**




(Nelson et al. forthcoming)

Note: Managers in areas identified in red are among the lowest 10% of managers when considering adaptive capacity.
Source: Updated from Nelson et al (2007)

**Figure 7** **Adaptive capacity in relation to perceptions of degradation**




Note: Perceptions of degradation refers to land managers' perceptions of whether they have a degradation problem, rather than to independent biophysical measures of the extent of a degradation issue.
Source: Nelson et al (2004)

The indicators can be used to identify factors to consider when setting desired bounds for a target (or benchmark). The indicators also serve to highlight the level of understanding of a regional or industry context that is required to set appropriate targets. The following need to be considered when setting targets for the adoption of specific management practices:

- Are resource managers' aspirations aligned with regional, industry and national outcomes?
- Do resource managers have access to appropriate types and levels of capital for use in adopting an alternative management practice?
- Are the desired regional or industry practices consistent with, and easily incorporated within, resource managers' farming systems?
- Will external influences have an effect on the level of adoption of a desired practice (eg drought on the adoption of revegetation practices)?

The MERI Framework places an emphasis on assessing the impact of programs on adoption. However, at the national scale a range of factors will have an impact on adoption. These other contextual factors need to be understood before targets can be used effectively.

A nested survey approach, as outlined by Nelson (2004), would have significant advantages over current surveys on the adoption of sustainable farming practices. National surveys could be used to prioritise industries and regions reporting significant land degradation. Then more detailed and nested regional surveys could be done. Successful trialling of this method could lead to the development of national indices based on the adoption of regionally relevant management practices. These national indices could also be assessed in terms of their suitability for target setting.

## Regional NRM bodies and the level of capacity, engagement, partnerships and recognition underpinning NRM delivery

In August 2006, SENCC recommended a national set of indicators and protocols to assist in assessing the impact of NRM programs on the social and institutional foundations of NRM. These indicators were then recommended by the Audit Advisory Council for national implementation in October 2006.

The indicators focus on four core outcome areas.

1. The capacity of regional NRM bodies, assessed in terms of:

- decision making and governance — whether there has been an increase in the effectiveness of decision-making structures, including composition, governance structures and systems
- capacity and support — whether there has been an increase in the capacity of regional NRM bodies to meet their responsibilities, including
  - having their own capacity-building strategies in place
  - reviewing and updating their plan and investment strategies
  - having a skilled and appropriate work force and network of NRM facilitators or officers in place
- resource characteristics — whether regional NRM bodies have adequate resources (human, financial and information) and institutional arrangements to meet their responsibilities.

2. The quality of partnerships between regional NRM bodies, and Australian, state and territory government agencies, assessed in terms of levels of trust, transparency in decision making and flexibility in negotiation.

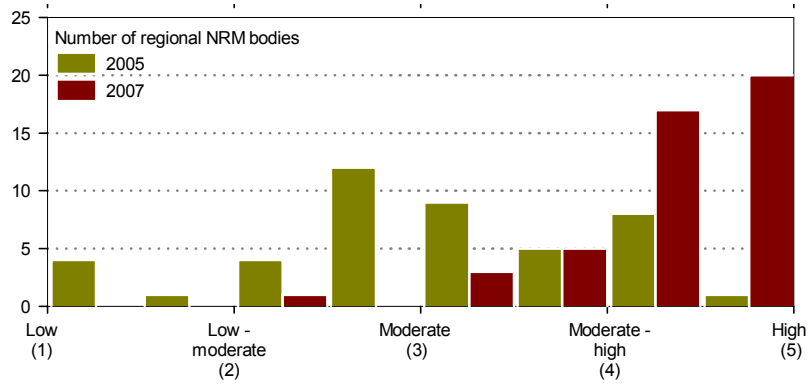
3. The nature of the stakeholder engagement processes, assessed in terms of whether there are sufficient opportunities for engagement, and the scale, quality and effectiveness of the engagement processes.

4. Recognition of the social foundations of NRM, assessed in terms of the extent to which the social foundations (engagement, partnerships and capacity building) are incorporated and recognised in

Australian, state and territory government policies, frameworks and guidelines and regional body activities.

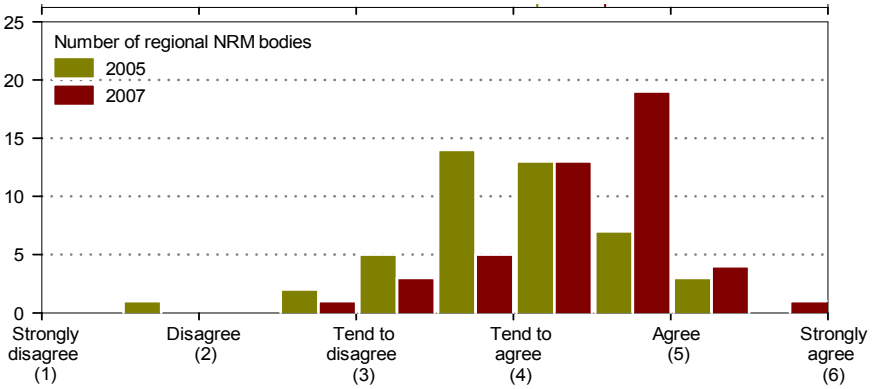
A national baseline study of NRM regional bodies and stakeholders was conducted in 2007, using the indicators. Over 85% of regional NRM bodies responded to the survey component of the study. Examples of the types of outputs generated by the survey included retrospective summary statements (Figures 8–10) and assessments against individual indicators (Table 3).

**Figure 8** **Level of confidence that a regional NRM body has adequate financial management systems, policies and processes in place to effectively achieve good financial management outcomes**



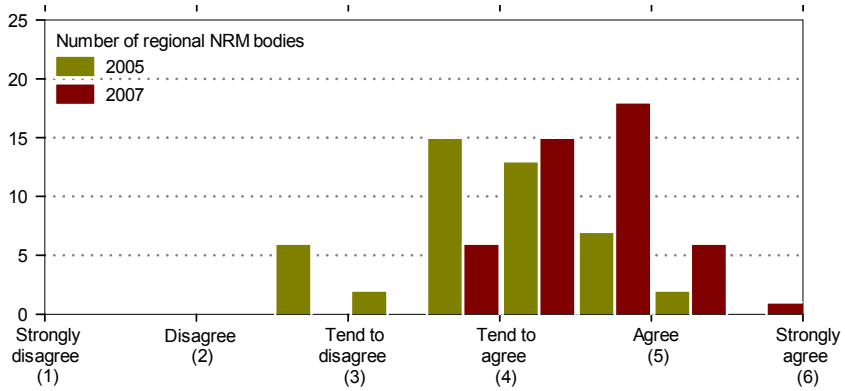

Note: Participants were not asked this question in 2005, instead in 2007 they were asked 'If you were asked this question two years ago, how would you have answered it?'

**Figure 9** **Level of agreement that there has been an effective partnership between a regional NRM body and Australian Government NRM agencies and departments**




Note: Participants were not asked this question in 2005, instead in 2007 they were asked 'If you were asked this question two years ago, how would you have answered it?'

**Figure 10** **Level of agreement that, in relation to the most recent NRM planning activities, the engagement processes have been effective in contributing to regional decision making**




Note: Participants were not asked this question in 2005, instead in 2007 they were asked 'If you were asked this question two years ago, how would you have answered it?'

A summary of the application of individual measures relating to the capacity of regional NRM bodies is shown in Table 3.

**Table 3** **Capacity of regional natural resource management bodies**

| Measures | Low | | Mid | | High |
|---|---|---|---|---|---|
| **Decision making and governance** | | | | | |
| Appropriate organisational structures | | | | | ■ |
| Good decision-making processes | | | | ■ | |
| Inclusiveness of NRM decision making | | | | ■ | |
| Organisational cohesion (staff and board) | | | | ■ | |
| Composition of decision-making structures | | | | | ■ |
| **Capacity and support** | | | | | |
| Staff training and development | | | | ■ | |
| Board member training and development | | | ■ | | |
| Job satisfaction | | | | ■ | |
| Capacity to review NRM plan and investment strategy | | | | ■ | |
| Effective local facilitator network | | | | ■ | |
| **Resources (human)** | | | | | |
| Competency in human resource management | | | | ■ | |
| Adequate staffing levels | | | ■ | | |
| Leadership competency | | | | | ■ |
| External leadership by the regional NRM body | | | | ■ | |
| Use of NRM advisory panels | | | | ■ | |
| Effectiveness of NRM advisory panels | | | | ■ | |
| Knowledge of NRM and planning | | | | | ■ |
| Knowledge of biophysical systems | | | | ■ | |
| Knowledge of economic systems | | | ■ | | |
| Knowledge of social systems | | | ■ | | |
| Knowledge of indigenous communities | | | | ■ | |
| Knowledge of corporate governance | | | | ■ | |
| **Resources (financial)** | | | | | |
| Competency in financial management | | | | | ■ |
| Financial management performance | | | | ■ | |
| Accessing NRM investment funds outside NAP/NHT | | | ■ | | |
| Capacity to prepare funding submissions | | | | ■ | |
| Capacity to lever external investment | | | ■ | | |
| **Resources (information)** | | | | | |
| Effective use of NRM information | | | | ■ | |
| Ability to access external sources of NRM information | | | | ■ | |

NAP = National Action Plan for Water Quality and Salinity; NHT = Natural Heritage Trust; NRM = natural resource managementNote: based on the judgments of regional NRM bodies and regional stakeholder organisations. Source: Fenton and Rickert (2008)

An important aspect of the indicators and the design of the study is that the results of the survey can either be aggregated to inform national decision making or disaggregated to provide confidential reports to regional NRM bodies for their own benchmarking purposes.

## Further information

Further details of the agreed indicators and associated studies, including full protocol documentation, are available on the National Land and Water Resources Audit website.[4] Protocols are guidelines for the measurement and reporting of the indicators.


[4] http://www.nlwra.gov.au/Natural_Resource_Topics/Socio-economic/index.aspx

# Indicator data needs

In general, the data needed for the indicators fall into three types, related to program effectiveness, program appropriateness and cost-effectiveness.

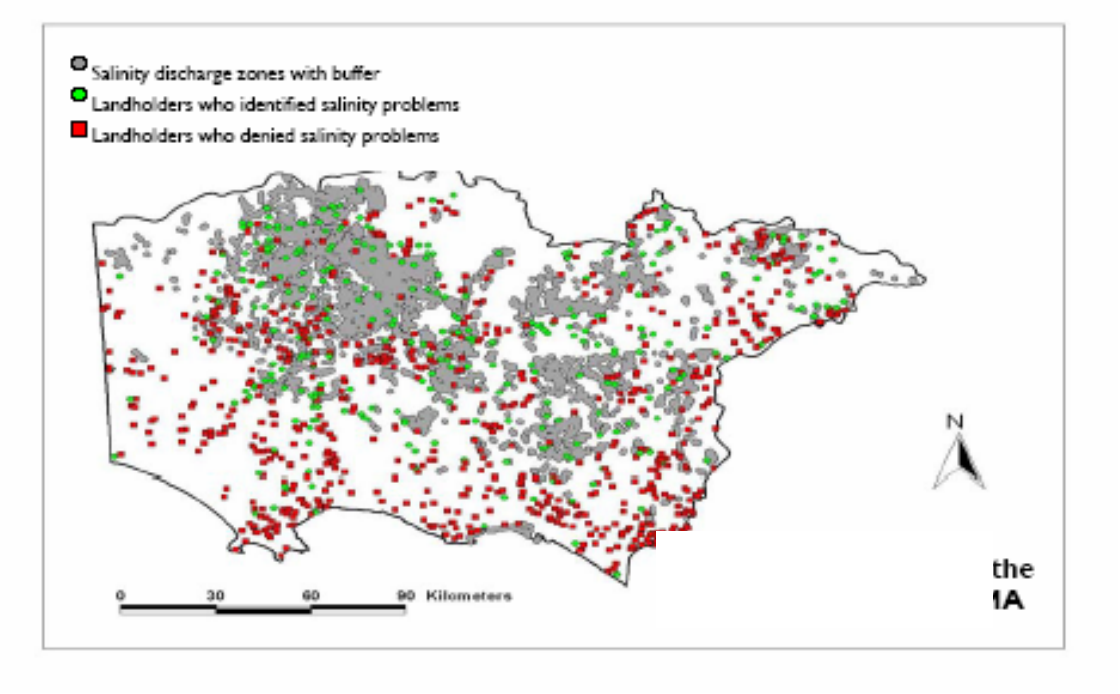
### 1. Data to assess program effectiveness

The indicator protocols identify the types of questions to use in regional or industry-based surveys. This type of data may also include national datasets, which assist with the interpretation of causality by placing regional and industry-specific results within a national or whole-of-government context.

### 2. Data to assess program appropriateness

This type of use combines the indicator data from regional surveys with biophysical data, as described by Byron and Leslie (2005) and demonstrated in Figure 11. In this instance, information on landholders' perceptions of salinity was compared with biophysical datasets identifying the actual location of salinity discharge zones.

**Figure 11 Landholders' perceptions of salinity and participation in NRM activities and location of salinity discharge zones**




Indicator data from national surveys of landholders may also be combined with nationally coordinated and standardised input and output information on a program. In this case, the sociodemographic profile of participants in the program would be compared with the target group of the program, the types of initiatives delivered and the level of funding.

### 3. Data to assess the cost-effectiveness of a program

This data use requires nationally coordinated and standardised input and output information on the program.

# Data and information systems

State, territory and national systems are used to report on the recommended indicators. National information systems, as illustrated in Table 4, are currently the principal source of information for reporting on the agreed indicators. Other data and information, such as climate and land use, are needed to supplement and interpret the socioeconomic information. This contextual data and information is managed by a range of other state, territory and national systems, and is documented in other reports in this series.

**Table 4 National information systems**

| National agency | Main system | General description | Website |
|---|---|---|---|
| NLWRA | Australia's Resources Online | Australia's Resources Online is a new application being developed by the Audit to report on the latest information available against National Monitoring & Evaluation Framework indicators | http://www.anra.gov.au/aro (under review) |
| NLWRA BRS | Signposts for Australian Agriculture | Signposts provides Australian agricultural industries with tools to assess, illustrate and demonstrate how their activities contribute to ecologically sustainable development in Australia. It provides:<br>• a reporting framework including associated outcome statements and indicators on the environmental, economic and social contributions of Australian agricultural industries<br>• a website with electronic profiles of the grains, meat, dairy, cotton, wine and horticulture industries<br>• reports summarising the contributions of individual industries | http://signposts4ag.com |
| ABS | ABS | Publications and interactive databases including the Census of Population and Housing, Agricultural Census, Agricultural Survey and Natural Resource Management Survey | http://www.abs.gov.au |
| ABARE | AGsurf | Historical collection of surveys of selected Australian agricultural industries, with data available at the national, state or regional level | http://www.abareconomics.com/interactive/agsurf |
| BRS | Country Matters — Social Atlas of Rural and Regional Australia | Social data displayed in the atlas is classified on a statistical local area (SLA) basis | http://adl.brs.gov.au/mapserv/pdfatlas/map.phtml |

ABARE = Australian Bureau of Agricultural and Resource Economics; ABS = Australian Bureau of Statistics; BRS = Bureau of Rural Sciences; NLWRA = National Land and Water Resources Audit

Implementing the MERI Framework for programs such as Caring for our Country will require the use of a systems approach. Key steps in such a systems approach would include the identification of:

- governance arrangements for evaluations at the national and state or territory scale, to facilitate consultation and the development of operational aspects of the MERI Framework
- responsibilities between the Australian, state and territory governments, and regions for

- the collection, reporting and management of data relating to the extent and condition of assets and program performance
- data management standards and guidelines

- key evaluation questions at the national, state or territory and regional scales to inform the design of data collection systems
- additional indicators relating to new intermediate and long-term outcomes of NRM programs
- common metrics to be used in national, state or territory and regional input and output reporting, in order to answer questions relating to the

- appropriateness of programs (ie if the program has targeted the right resource managers, in the right regions, on the right issues and using the right initiatives)
- efficiency of programs.

# Data availability and gaps

## National availability of data for indicators relating to resource managers

Previous sections have identified a range of uses for the national indicators, including the:

- identification of areas at risk of inappropriate management practices (eg chemical inputs or resource harvest and use)
- evaluation of the appropriateness of NRM programs by comparison between participants in NRM activities and non-participant target groups
- benchmarking or target setting for the level of adoption of practices specific to an industry and region
- prioritisation of delivery by identification of barriers to adoption and the type of capacity-building activities required
- evaluation of the effectiveness of programs by examination of the relationship between the adoption of specific practices and participation in NRM activities.

A national overview of social and economic data sources for NRM has been commissioned by the Audit (Sincock and Smith 2004). The report identifies sources, geography and frequency of collections, and provides information on nationally available data on human capital, social capital, produced economic capital, participation in NRM programs, and landholders' attitudes and behaviours.

Nationally consistent, ongoing sources of socioeconomic data that are capable of supporting NRM programs include the:

- ABS Census of Population and Housing
- ABS Natural Resource Management Survey
- ABS Agricultural Census and Agricultural Survey
- ABARE Farm Survey
- ABARE Natural Resource Management Survey.

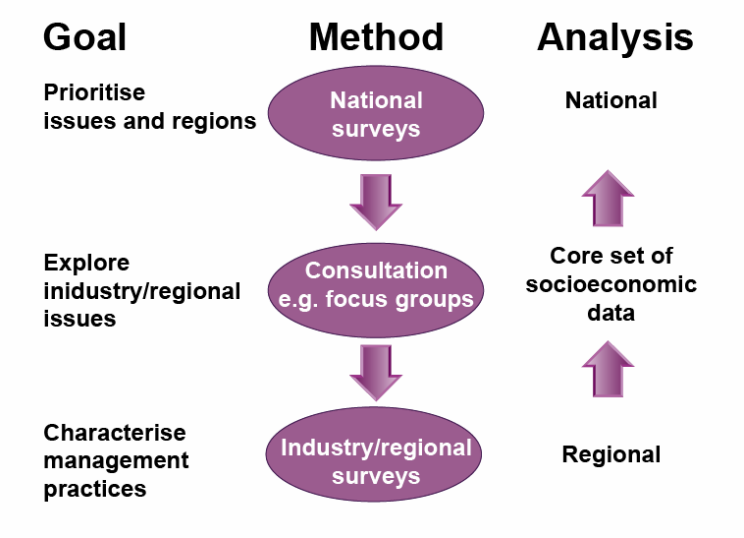
The Audit engaged ABARE and BRS to identify principles and priorities for future collections relating to NRM programs. The report assessed the capability of ABS and ABARE collections to capture information on the national social and economic indicators. The report highlighted how the movement to a regional and catchment focus for government programs has meant that more specific or tailored regional data is

required in regions with high priority issues. These regions should be targeted for tailored surveys on the basis of national priorities, under a model of nationally nested regional surveys (Nelson et al 2006) (see Box 1).

**Box 1 Nested industry and regional surveys**

Under a model of nested surveys, national surveys would be used to prioritise industries and regions for more detailed investigations of land degradation and management practices (Figure 12). Focus groups drawn from existing industry and regional networks (eg regional groups, production and Landcare groups) would identify industry or regional NRM issues of high priority for investigation.

**Figure 12 Nested regional surveys of Landcare participation and the adoption of sustainable faring practices**




The focus group process could also be used to:

- identify industry and regional differences in the nomenclature used for a practice
- interpret management responses
- explore the concepts and processes involved in decision making.

Importantly, the management practices in question would be based on locally relevant terminology, gained via the industry and regional consultation process.

The link back to national surveys from the detailed industry and regional surveys would be formed by a common core set of socioeconomic data. This would enable the results of the detailed surveys to be compared nationally across industries and regions. Successful trialling of this methodology could lead to the development of national indices based on the adoption of regionally relevant management practices. These national indices could also be assessed in terms of their suitability for target setting.

The Audit has also assessed the suitability of existing ABS national datasets to create practical measures of the adaptive capacity of Australian land managers. A pilot study was recommended, which is currently being undertaken by ABARE in cooperation with the ABS and CSIRO (Nelson et al 2007).

A recent study commissioned by the Audit confirmed that there is significant use of existing ABS and ABARE collections by state and territory government agencies (KPMG 2008). However, as discussed earlier, an important limitation in the use of national collections in assessing the level of adoption of management practices is that their design and interpretation needs to be tailored to the:

- targeted regional or industry priorities and practices
- farming systems of interest
- local nomenclature for a practice (names given to the same practice can vary among regions and industries).

The social and economic indicators offer an important first step in coordinating national, industry and regional collections. Future advances will depend on further coordination of national collections. There is potential for the development and testing of a nationally nested industry and regional survey model.

## State and regional availability of data

Although several data collections occur at the national or industry scale, there is a paucity of data available to support the indicators at the state or territory and regional scale (KPMG 2008). In addition, existing social and economic data reside within a much more diverse range of organisations compared with organisations holding biophysical data, including:

- catchment management authorities
- industry bodies and research and development corporations
- irrigators and other state and territory-based industry groups
- Landcare groups
- a wide range of state and territory government agencies
- local government
- university and research institutions
- private consultants.

Access to these social and economic datasets is constrained due to a lack of awareness, concerns over potential public sensitivity and commercial-in-confidence requirements (KPMG 2008). In addition, social and economic data coordination and management in the NRM context is less mature than biophysical data coordination and management. As discussed earlier, KPMG (2008) found that there were very few instances of metadata records for collections relevant to the social and economic indicators at the state or territory scale.

## National availability of data

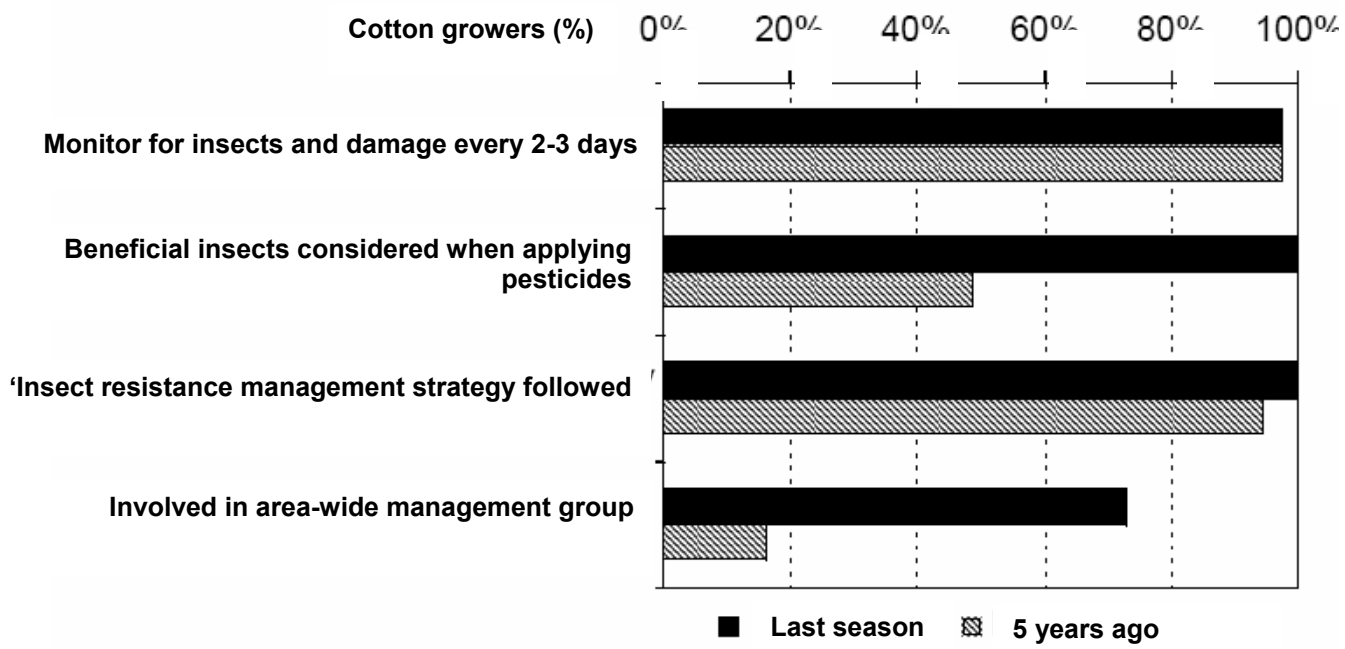
As a result of the national survey commissioned by the Audit (Fenton and Rickert 2008), baseline data on the indicators relating to regional NRM bodies are available. Although the survey had excellent coverage spatially (enjoying an 85% response rate), it represented only one point in time. It will rely upon a commitment for future funding to provide trends over time. No other similar collections are currently planned. Hence, it would be advisable to repeat the survey in 2009–10, in order to inform the mid-term evaluation of Caring for Our Country. One of the benefits of the survey has been the voluntary alignment of regionally funded surveys with the national indicators.

## Measures of change and trends — cotton industry example

Examples of changes in the level of adoption of management practices exist on the individual industry and regional scale, but only on an isolated basis or from retrospective questionnaires. The following is an example, which has been extracted from the Signposts for Australian Agriculture profile for the cotton industry.

The level of adoption by cotton farmers within the Australian cotton industry best management practice program was surveyed by Cotton Australia and the Cotton Research and Development Corporation (Macarthur Agribusiness 2004). Figure 13 shows that monitoring for insects and damage every 2–3 days was maintained at a high level between 1998 and the 2003 season on surveyed farms (approximately 97% adoption). Surveyed farms increased their adoption of practices such as considering beneficial insects, following a resistance management strategy and becoming involved in an area-wide management group between 1998 and the 2003 season.

**Figure 13** **Percentage of cotton growers who applied specified practices relating to pest management in 2003 and 1998**




Although it is desirable to establish longitudinal information on the level of adoption of specific management practices, this has not yet occurred. An examination of information on management practices contained under Signposts reveals that most data refer to a single point in time.

The national protocols (Byron et al 2006, Fenton and Rickert 2008) and the associated *Sourcebook for Social and Economic Surveys* (Hanslip and Byron 2007) give examples of the types of data and associated survey questions required to improve data collection.

# Data and information products

In collaboration with SENCC, the Audit has built substantial capacity for long-term reporting at a variety of scales, based upon the social and economic indicators. Data at national and state or territory levels in this booklet are examples of improved products resulting from the activities of the Audit and its partners. Products are supported by data and information in a variety of forms, such as maps, tables, charts and graphs.

Data and information can be reported for a range of purposes, according to different boundaries of interest, for example, national, state or territory, NRM regions and industry zones.

## Identification and characterisation of resource managers — regional profiles

One key development has been to base regional profiles around the data needs of the national social and economic indicators recommended by SENCC (Figure 14).

**Figure 14 Examples of data on land use and water use on a regional scale**

**2.5** LAND USED TO DERIVE AN AGRICULTURAL INCOME, 2003-04 ..

| | *Land under crop* | *Beef cattle farming* | *Other agricultural activites* | *Total(a)* |
|---|---|---|---|---|
| Clyde River-Jervis Bay Basin | | | | |
| Number of holdings | 21 | 50 | 35 | 76 |
| Land cover *(ha.)* | 37 | 6 409 | ^923 | 6 867 |
| Land cover *(%)* | 1 | 93 | 13 | 100 |
| Moruya River Basin | | | | |
| Number of holdings | 19 | 87 | 30 | 115 |
| Land cover *(ha.)* | 46 | 12 514 | 1 258 | 13 791 |
| Land cover *(%)* | — | 91 | 9 | 100 |
| Tuross River Basin | | | | |
| Number of holdings | 18 | 105 | 44 | 137 |
| Land cover *(ha.)* | 116 | 10 494 | 5 769 | 14 165 |
| Land cover *(%)* | 1 | 74 | 41 | 100 |
| Bega River Basin | | | | |
| Number of holdings | 5 | 20 | 9 | 29 |
| Land cover *(ha.)* | 10 | ^966 | ^764 | 1 723 |
| Land cover *(%)* | 1 | 56 | 44 | 100 |
| Total for Eurobodalla Shire | | | | |
| **Number of holdings** | **63** | **262** | **118** | **357** |
| **Land cover** *(ha.)* | **208** | **30 383** | **^8 713** | **36 545** |
| **Land cover** *(%)* | **1** | **83** | **24** | **100** |

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
— nil or rounded to zero (including null cells)
(a) Components do not add to total due to possible multiple land uses on each holding

**4.3** SOURCES OF WATER, as at 30th June 2004 .....

| | BASIN | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Clyde River-Jervis Bay* | | *Moruya River* | | *Tuross River* | | *Bega River* | | *Total for Eurobodalla Shire* | |
| | no. | % | no. | % | no. | % | no. | % | no. | % |
| **Total number of in scope holdings** | **743** | **100** | **704** | **100** | **816** | **100** | **64** | **100** | **2 327** | **100** |
| Source of water(a) | | | | | | | | | | |
| Tank water | 508 | 68 | 505 | 72 | 612 | 75 | 47 | 74 | 1673 | 72 |
| Rivers and creeks | ^232 | 31 | 256 | 36 | 243 | 30 | 39 | 61 | 770 | 33 |
| Dams | 454 | 61 | 401 | 57 | 479 | 59 | 35 | 55 | 1368 | 59 |
| Mains supply | ^80 | 11 | ^85 | 12 | ^119 | 15 | ^13 | 20 | ^297 | 13 |
| Bores and wells | ^100 | 14 | *34 | 5 | ^40 | 5 | *4 | 7 | ^178 | 8 |
| Springs | ^41 | 6 | ^62 | 9 | ^67 | 8 | ^8 | 12 | ^177 | 8 |
| Other | *36 | 5 | *23 | 3 | ^42 | 5 | ^12 | 19 | ^112 | 5 |

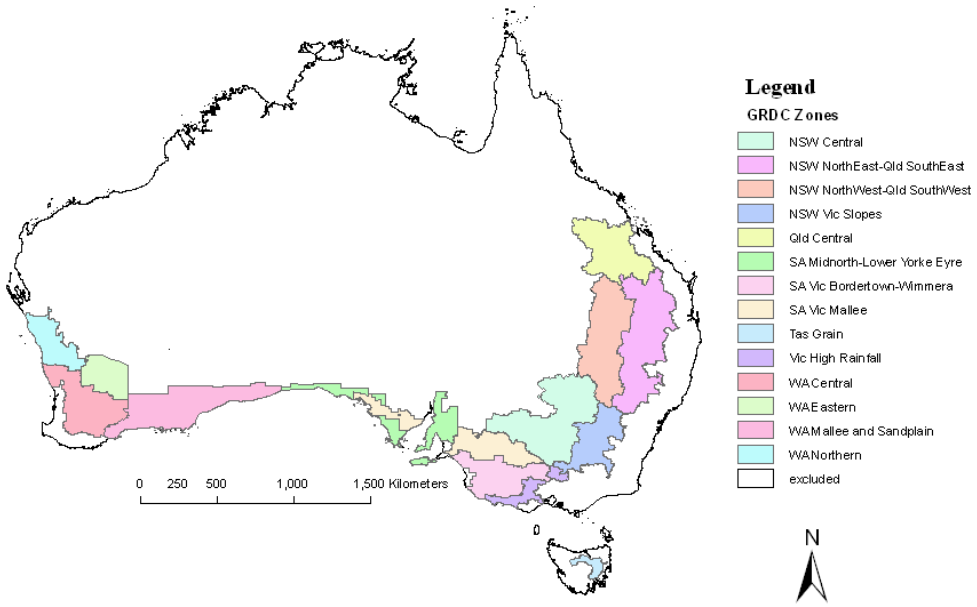
^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
* estimate has a relative standard error of 25% to 50% and should be used with caution
(a) Landholders could have more than one source of water on their holding

Source: ABS (2006)

## Identification and characterisation of resource managers — industry profiles

Another key development was to leverage change in the collection and reporting of ABS statistics, so that data could be aggregated to a wider range of regional boundaries via the use of mesh blocks. This method enables social and demographic information to be aggregated to a range of industry boundaries, such as the Grains Research and Development Corporation agroecological zones (Figure 15).

**Figure 15 Map of Grains Research and Development Corporation agroecological zones**



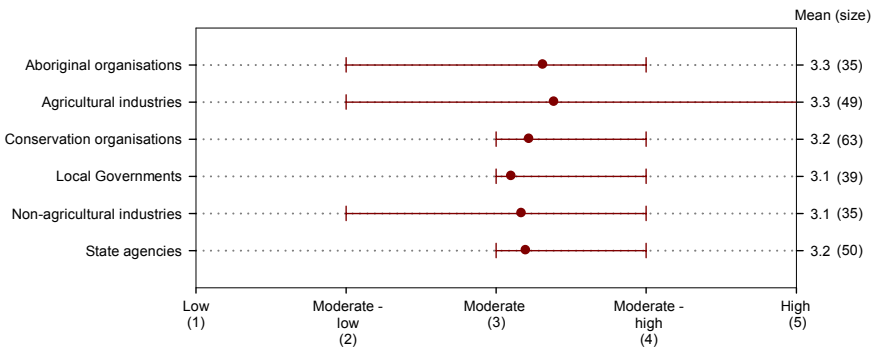

Source: GRDC Agroecological Zones (http://www.grdc.com.au/director/apply/agroecologicalzones)

## Engagement of individuals and resource managers

A key measure of engagement in NRM programs is the level of participation by a target group. Agriculturalists manage more than 60% of Australia's land resources and are often a key target group of NRM program activities. The Australian Bureau of Statistics obtains data pertaining to individual resource managers as part of the Agricultural surveys and could group the results of their surveys to various regional boundaries – for example, using ABS data the level of participation of agriculturalists in NRM programs could be mapped to regional NRM boundaries.

The Audit commissioned a national survey of regional NRM groups, their stakeholders and government agencies, based on the national social and economic indicators recommended by SENCC. Figure 16 captures the perspectives of different stakeholders when replying to the question 'In relation to the most recent NRM planning activities, in the last 12 months the level of participation by stakeholders, landholders and the community in these activities has been...'

**Figure 16 Quality and scale of community engagement**

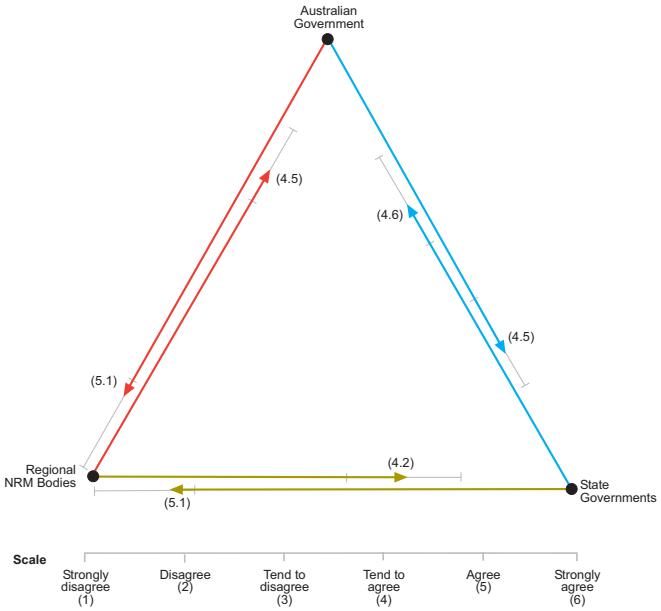


Note: Graph shows the upper and lower limits of the interquartile range where 50% of regional bodies are represented.
Source: Fenton and Rickert (2008)

## Partnerships established

Figure 17 illustrates the new reporting format that was established to display some of the results relating to the level of trust in partnership arrangements (Fenton and Rickert 2008).

**Figure 17 Level of trust in partnership arrangements**

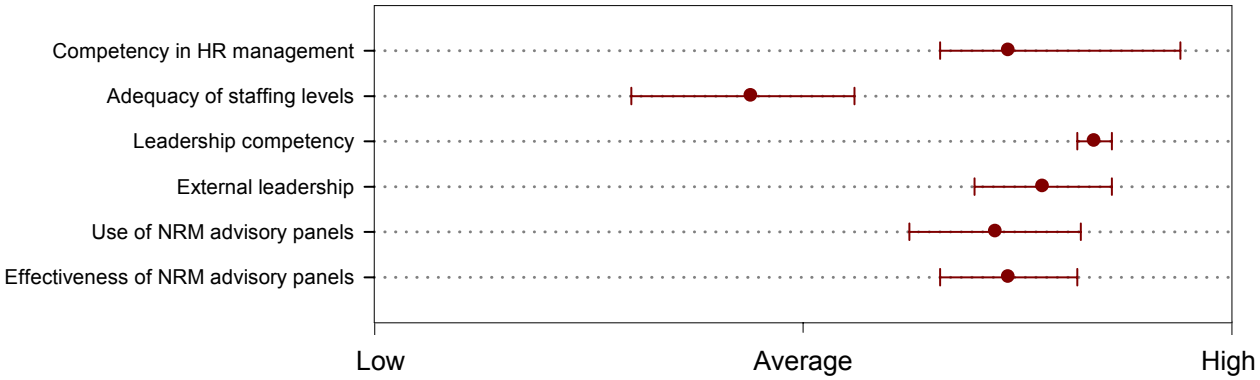



NRM = natural resource management
Source: Fenton and Rickert (2008)

## Enhanced capacity of regional natural resource management bodies

Figure 18 illustrates how multiple responses to a survey can be aggregated into a summary measure of the capacity of NRM bodies in terms of their human resources.

**Figure 18 Summary measures — human resources**

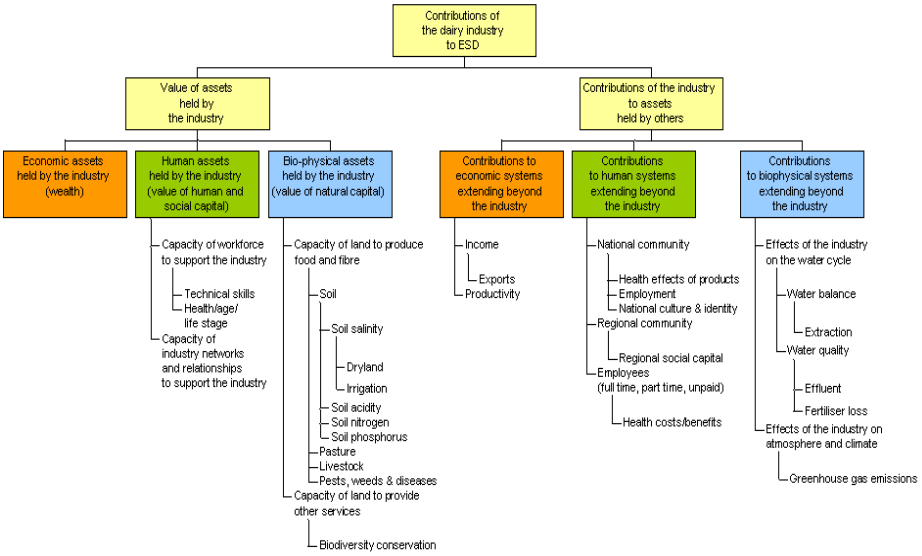


NRM = natural resource management
Note: Graph shows the upper and lower limits of the interquartile range where 50% of regional bodies are represented.
Source: Fenton and Rickert (2008)

## The contribution of agriculture to ecologically sustainable development — Signposts for Australian Agriculture


Signposts generates integrated products, which assemble information from economic, social and environmental domains, as illustrated in the reporting framework for the dairy industry (Figure 19).

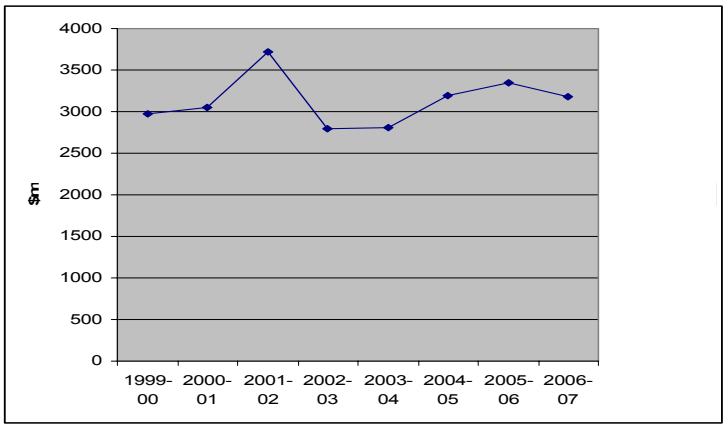
**Figure 19 Signposts industry profile for dairy production**




ESD = ecologically sustainable development
Source: http://signposts4ag.com/signposts-dairy/glossary/full-component-tree

An example of the kinds of data available under the Signposts framework is shown in Figure 20.

**Figure 20 Dairy industry gross value of production, 1999–2000 to 2006–2007**




Source: ABARE (2007)

## Related social and economic information

A number of systems and products that provide information related to the social and economic indicators in the future are available. Although these products do not report directly on the indicators, they provide multiple lines of evidence for the evaluation of progress and effectiveness of NRM programs.

The Australian Natural Resources Atlas (the Atlas)[5] provides a number of tools and access to theme summaries and reports from the Audit, including Australia's Resources Online and Map Maker.

Australia's Resources Online is a new component of the Atlas being developed by the Audit for ongoing reporting on the National M&E Framework indicators.[6]

[5] http://www.anra.gov.au

Map Maker is an online geographic information system tool for creating maps at regional, state and national levels.

The Australian Natural Resources Data Library enables discovery of and access to data and information products.[7]

# Discussion and way forward

The Audit and its partner organisations have developed methods and protocols, undertaken trials, improved existing data and information, and refined data management and exchange infrastructures.

A coordinated national system for reporting on the recommended social and economic indicators for NRM is progressively being put in place. This has been a major achievement and further development and alignment of state and territory systems will be highly beneficial.

Ongoing and effective coordination will require a genuine commitment to a shared vision and clear assignment of responsibilities (and associated costs) for data collection and management at national, state and regional levels. The capacity of regional NRM bodies to undertake long-term monitoring is limited, in part by the duration of their funding arrangements and the nature of their reporting requirements.

The partnerships developed through SENCC have assisted greatly in clarifying these responsibilities and further advances are expected to be achieved through this forum. There is a great collaborative spirit and willingness to continue to improve understanding, capacity and outcomes in the social and economic information arena.

## National coordination

The following are issues for consideration regarding future coordination of social and economic data infrastructure for NRM:

- A systems approach is required to establish monitoring and evaluation data infrastructure — indicators form but one component of that system. Explicit monitoring and evaluation, and implementation planning are required to guide investment in social and economic data and associated infrastructure for the NRM MERI Framework program strategies.
- The scope of the natural resource management MERI Framework has been broadened to include social and institutional assets (eg indigenous groups, peri-urban landholders, public resource managers, other resource-based industries such as fishing, forestry and mining). Consequently, additional indicator development may be required.
- Further national coordination is required across
  - policy areas — the policy questions addressed by Signposts and the SENCC social and economic indicators serve three major policy domains: NRM, climate change and structural adjustment; greater coordination across these policy areas could enhance the effectiveness and efficiency of future investments in social and economic data infrastructure
  - data providers from the other national coordination committees — the extent to which causal relationships between the achievement of intermediate, long-term and aspirational outcomes can be demonstrated will depend on the integration of socioeconomic and biophysical information; similarly, evaluations of the appropriateness of programs will require spatially referenced input and output information and standardised reporting categories to be linked with the SENCC social and economic and Signposts indicators

[6] http://www.anra.gov.au/aro
[7] http://adl.brs.gov.au/anrdl/php

- sectors — industry is a major investor in the collection of social and economic information, particularly on management practices; opportunities for industry and regional co-investments in collections are likely to increase under the new Caring for Our Country program, and should be harnessed.

- Specific future project activities could include
- development of a communications strategy to connect the full spectrum of users and providers
- capacity building in the use and analysis of the SENCC indicators and associated national datasets for reporting on program effectiveness, appropriateness and efficiency
- collaborative work with national data providers to further support the indicators
- development of consistent metadata standards across and within jurisdictions
- support for the adoption of the ANZLIC[8] Metadata Profile as the national standard for capturing metadata for social and economic data, which is collected for NRM or NRM-related purposes together with a more consistent approach to capturing data within the ANZLIC Metadata Profile
- encouragement for all states and territories to develop custodianship policies.

## Conceptual frameworks

Indicator development is an evolving activity. This is particularly the case in the area of social and economic information, as indicators have to evolve with changes in desired policy outcomes. Institutional processes and forums are required to coordinate ongoing indicator development and refinement.

## National indicators

Evaluations of the impact of NRM programs require regional and industry-specific surveys and studies based on the SENCC indicators. Participatory research with NRM policy advisers at the national, state, regional and industry scales, to evaluate and refine the indicator measures and applications, is an important priority focus of research.

A community of practice should be established to focus on adaptive capacity research. Current research and data collection activities on adaptive capacity reside across multiple policy domains (MERI Framework, drought policy, climate change and structural adjustment), yet they pertain to common intermediate and long-term outcomes of these policy and program areas.

An evaluation of the use and impact of the indicators and associated collections should be conducted as the basis for ongoing funding. In terms of causality — the relationship between the achievement of intermediate-term outcomes and the achievement of long-term outcomes — needs to be articulated and documented. Although some documentation exists, a body of evidence has not yet been assembled.

## Data needs

Data are required to inform indicators. This is documented in the protocols and associated supporting documents such as the *Sourcebook for Social and Economic Surveys* (Hanslip and Byron 2007). The focus to date has been on assessing the effectiveness of programs. Answering ancillary questions on the appropriateness and efficiency of programs will depend on further development of input and output data and reporting systems within government.

[8] ANZLIC = the Spatial Information Council

## Data and information systems

Data and information systems need to include a communications strategy. This strategy could include face-to-face engagement with users, a needs analysis and multiple methods for conveying information on how to use data in planning, monitoring and evaluation. It is also important for people to know how to integrate information sources for different uses.

The design of data and information systems at the Australian, state and territory government levels could occur in parallel with the development of an operational MERI Framework strategy.

## Data availability and gaps

Further work is required to define the priority sustainable NRM practices to be monitored at the industry or regional scale. The Signposts for Australian Agriculture project and reporting framework provide a suitable consultative mechanism for this.

The development and trial of nationally nested industry and regional data collections is considered to be an immediate priority.

The national survey of regional NRM bodies and stakeholders should be repeated in May 2009, in order to inform future mid-term evaluations of national programs.

## Data and information products (reports and assessments)

The emphasis can now shift from promoting the integration of social and economic data to also incorporating biophysical datasets. Communication activities based around these integrated social and biophysical information products should be conducted to assist in informing future investments in data infrastructure.

## Institutionalising social and economic data for NRM

The success of SENCC's activities will depend on the extent to which the recommended social and economic indicators are firmly embedded into the MERI Framework for NRM programs and associated evaluation activities.

Further advances in assessing the appropriateness and efficiency of programs will depend on the institutional alignment of financial management and performance management systems at the Australian, state and territory government levels.

# Appendix 1 The National Monitoring and Evaluation Framework

The National Natural Resource Management Monitoring and Evaluation Framework (referred to in this series as 'the National M&E Framework') was endorsed by the Natural Resource Management Ministerial Council in 2002 (NRMMC 2002). It was developed to assess progress towards improved natural resource condition through the development of accurate, cost-effective and timely information on:

- the health of Australia's land, water, vegetation and biological resources
- the performance of programs, strategies and policies that provide national approaches to the conservation, sustainable use and management of these resources.

Assessment of information collated under the National M&E Framework will assist the Ministerial Council to 'identify areas of concern and to better target the use of resources'.

The framework identifies three key requirements for monitoring natural resource condition:

1. a set of natural resource condition indicators (including those for the 'matters for target' identified in the National Framework for Natural Resource Management Standards and Targets) to measure progress towards agreed national outcomes on a medium and long term basis
2. a set of indicators for monitoring community and social processes relevant to or affected by NRM programs, as well as measures of the adoption of sustainable development and production techniques
3. contextual data pertinent to the indicator being considered.

The National Land & Water Resources Audit ('the Audit') is responsible for ongoing development of these indicators, as well as supporting the national collection and collation of data, and reporting against each indicator.

Such reporting will help to answer questions such as:

- What is the nature and extent of the issue?
- Is the existing or proposed intervention appropriate for the size of the issue?
- What types of intervention work best, are most cost-effective, and have the best transferability across regions?
- What was the impact of the policy or program investment — in the intermediate and long term?

Monitoring and evaluation of core indicators supports evidence-based decision making at national, state and territory, and regional levels. However, each level may have a wide variety of data and information needs, in terms of content, context or scale. There is also complexity across the three levels of use associated with multiple needs, values, preferences and timeframes.

# References


ABARE (Australian Bureau of Agricultural and Resource Economics) (2007). *Australian Commodity Statistic*, ABARE, Canberra.

ABS (Australian Bureau of Statistics) (2006). *Water Account*, Catalogue No 4610.0, ABS, Canberra.

Burnside D (2007a). *The Relationship between Community Vitality, Viability and Health and Natural Resources and their Management — A Brief Review of the Literature*, NLWRA, Canberra.

Burnside D (2007b). *The Relationship between Community Vitality, Viability and Health and Natural Resources and their Management — Final Report*, National Land & Water Resources Audit, Canberra.

Byron I and Leslie R (2005). Integrating biophysical and socio-economic data through the use of spatially referenced survey data in the Glenelg Hopkins region of south-east Australia. In: *The Sixth Open Meeting of the Human Dimensions of Global Environmental Change Research Community,* IHDP, Proceedings of the International Human Dimensions Program on Global Environmental Change, 9–13 October 2005, University of Bonn, Germany.

Byron I, Nelson R, Webb T and Cody K (2006). *Socio-economic indicators and protocols for the National NRM Monitoring & Evaluation Framework*: *Capacity of landmanagers to adopt sustainable management practices*, National Land & Water Resources Audit, Canberra.

Ellis (2000). *Rural Development and Diversity in Developing Countries*, Oxford University Press, Oxford, United Kingdom.

Fenton DM (2006). *Socio-economic Indicators and Protocols for the National NRM Monitoring and Evaluation Framework: The Social and Institutional Foundations of NRM*, National Land & Water Resources Audit, Canberra.

Fenton DM and Rickert A (2006). *Refining Indicators for Monitoring and Evaluating the Social and Institutional Foundations of Regional NRM Programs*, Department of the Environment and Heritage and the Department of Agriculture, Fisheries and Forestry, Canberra.

Fenton M and Rickert A (2008). *A National Baseline of the Social and Institutional Foundations of Natural Resource Management Programs*, National Land & Water Resources Audit, Canberra.

Hanslip M and Byron I (2007). *Sourcebook for Social and Economic Surveys: Assessing Landmanagers' Capacity to Change and Adopt Sustainable Management Practices*, NLWRA, Canberra.

Hodges A and Goesch T (2006). *Australian Farms: Natural Resource Management in 2004–05*, ABARE Research Report 06.12, Australian Bureau of Agricultural and Resource Economics, Canberra.

KPMG (2008). *Assessment of Social and Economic Data for the National Natural Resource Management Monitoring and Evaluation Framework*, National Land & Water Resources Audit, Canberra.

Macarthur Agribusiness (2004). *Evaluation of the Australian Cotton Industry Best Management Practices Program 2004*, Cotton Australia and the Cotton Research and Development Corporation, Brisbane.

Nelson R (2004). *Socio-economic Indicators for Natural Resource Management: Capacity to Change and Adopt Sustainable Management Practices in Australian Agriculture*, Australian Bureau of Agricultural and Resource Economics, Canberra.

Nelson R, Alexander F, Elliston L and Blias A (2004). *Natural Resource Management on Australian Farms*, ABARE eReport 04.7, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

Nelson R, Kokic P, Elliston L and King J (2005). Structural adjustment: a vulnerability index for Australian broadacre agriculture. *Australian Commodities* 12(1):171–179.

Nelson R, Webb T and Byron IA (2006). *Socioeconomic Data — Prioritising Collection to Support Australian Government Natural Resource Management Programs: Principles and Priorities*, National Land & Water Resources Audit, Canberra.

Nelson R, Brown PR, Darbas T, Kokic P and Cody K (2007). *The Potential to Map the Adaptive Capacity of Australian Landmanagers for NRM Policy Using ABS Data*, National Land & Water Resources Audit, Canberra.

NRMMC (Natural Resource Management Ministerial Council) (2002). *National Natural Resource Management Monitoring and Evaluation Framework*, NRMMC, Canberra. http://www.nrm.gov.au/me/index.html (Accessed 20 October 2008)

Sincock A and Smith T (2004). *Social and Economic Data Sources for Natural Resource Management*, National Land & Water Resources Audit, Canberra.

## About the ‘Status of Natural Resource Information’ Series

This series of booklets outlines the status of natural resource data and information relating to indicators agreed under the National Natural Resource Management Monitoring and Evaluation Framework (2002). Each booklet describes the status of coordination, indicators, information management systems, and data and information products for a particular theme area.

- Estuarine, coastal and marine
- Inland aquatic ecosystems (wetlands)
- Land salinity
- Land use
- Native vegetation
- Significant invasive species (vertebrate pests)
- Social and economic information (this report)
- Soil condition