

## ENHANCING CROSS-SCALE KNOWLEDGE-SHARING FOR BROAD SCALE SOLUTIONS

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### Abstract

Regionally based planning approaches are currently being emphasised as appropriate institutional arrangements to provide broad scale solutions to land degradation issues within Australia. Evidence of this emphasis can be seen within Commonwealth Government initiatives such as the National Action Plan on Salinity and Water Quality (NAP) and the Extension of Natural Heritage Trust (NHT2), which both encourage the development of regional plans for natural resource management. However, the implementation of actions to achieve these regionally initiated solutions is often dependant upon the decisions and actions of multiple land managers including the coordination of their goals and actions.

The study was conducted with regional organisations and beef cattle producers within the Northern Gulf region of Queensland. This paper presents preliminary options that could potentially improve the ability of key decision makers to share knowledge of both regional and property level goals and actions for resource management. Through the sharing of this knowledge, it is possible to enhance the capacity of regional and property level decision makers to undertake actions that are mutually beneficial to the goals and outcomes at each level. The study developed these options by conducting an analysis of the decision-making environment for resource management at both the property and regional level. Each analysis drew on data from in-depth interviews, participant observations and document analysis. Finally, both the common links and the differences between the two decision-making levels were examined in an overall systems analysis.

Additional Keywords: regional planning, natural resource management, desired outcomes, on-ground action

### Introduction

Within Australia, the management of land degradation issues is increasingly being focussed on the integrated catchment and regional scales as opposed to just being focussed on individual farm, district or sub-catchment levels (Conacher and Conacher, 2000). Evidence of this focus can be seen within many of the initiatives of the Australian Commonwealth Government, as well as State Governments, where the development of regional plans is encouraged or even mandatory in some cases. Two examples of national initiatives related to natural resource management and which incorporate provisions for regional plans, include the National Action Plan on Salinity and Water Quality (NAP) and the Extension of the Natural Heritage Trust (NHT). Another national initiative 'The Guidelines and Principles for Rangeland Management' clearly sets out the perceived value of taking a regional approach;

*"By fostering and facilitating regional approaches within the rangelands, management can be more directly related to the distinctive character and opportunities within specific regions and ensure greater local ownership and responsibility for management decisions"* (ANZECC and ARMCANZ, 1999).

The emphasis of planning and managing at the regional scale could also be seen as a result of the recognition that the majority of resource degradation problems are broad scale problems that span across many land owners and can not be simply addressed at the individual property scale (Stafford Smith *et al.*, 2000). Consequently, there is an overwhelming need for these landowners to make coordinated contributions toward the practical implementation of actions that address these problems (Pickup and Stafford Smith, 1993, Cary, 2001, Moore *et al.*, 2001).

The study on which this paper draws from, examined the current linkages between the desired outcomes and activities of regional planning and policy for natural resource management, and those of property level natural resource management within the Northern Gulf region of Queensland. Through this investigation, we identified key opportunities and constraints for strengthening the link between these two levels of decision-making, and hence were able to identify some preliminary principles and options for improving the sharing of knowledge between the two scales to create more effective on-ground action. This paper presents these preliminary options and principles for sharing knowledge of outcomes and activities in the aim of improving the effectiveness of on-ground action.

## Materials and Methods

### *The Study Area*

The study area is located in the Northern Gulf region within northern Queensland (Figure 1). The main land use within this region is cattle grazing of native grasses. The property level component of this study therefore focuses on natural resource management activities on grazing properties.

### *The Study Approach*

The methods used within this study were designed to generate qualitative data with a focus on depth and detail of information. Essentially, we conducted an investigation of the desired outcomes, activities and motivations for natural resource management at both the regional and property scale. Each of these investigations made use of triangulation, (Patton, 1990).

This involved using a number of methods and data sources within each investigation to increase the validity and reliability of the findings. The variety of data sources that were used included various individual perspectives, scientific and policy documents, and researcher perspectives. The multiple methods made use of included participant observation, in-depth interviews and document analysis. Within the property scale investigation, a case study approach was used that combined the methods discussed above. Each of the eight case studies was a detailed investigation of a grazing property that was selected according to a number of criteria including management type, manager age, property size and location within the study area.

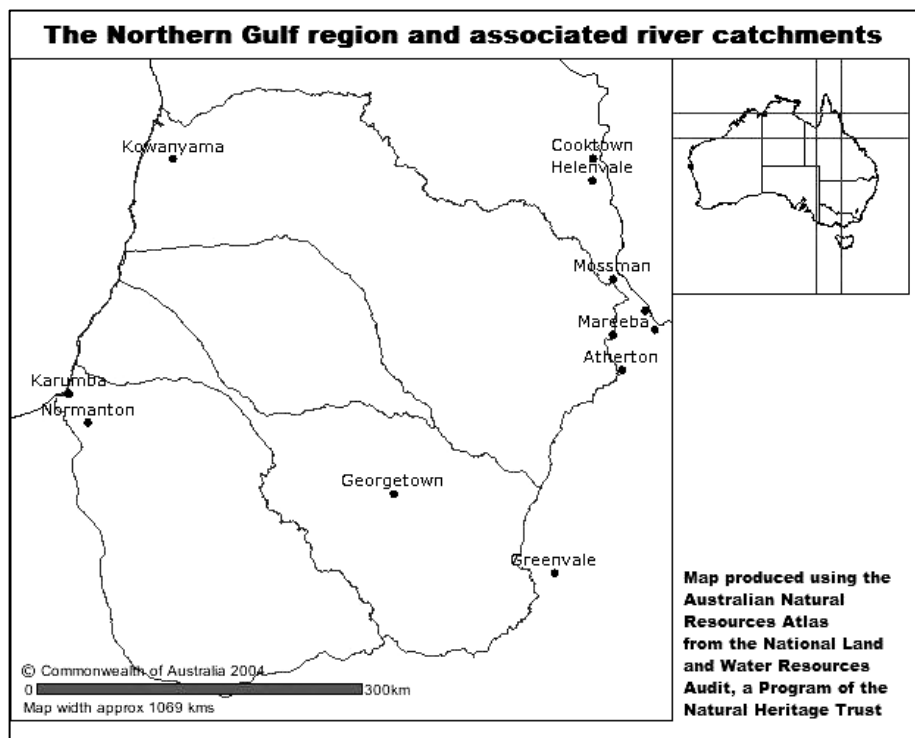
The data produced from the two investigations at the regional and property scale were then used within a third investigation to make comparisons and contrasts between the desired outcomes and activities of each scale.

### *Analysis*

The data produced within the study was analysed through a process known as content analysis, which involves identifying, coding and categorising the primary patterns in the data (Patton, 1990). A number of coding rules were set in order to determine the categories and levels where the data would be coded during the content analysis of the data from the regional and property scale investigations. These rules related to the type of content (whether the content was a goal, outcome, action, influence or motivation for resource management), the rationale behind the type of content, and the relationships of that content to other content. The categories created from these rules were then used to make contrasts and comparisons between the two scales. Due to the unstructured nature and magnitude of the data produced, a computer software programme known as NVivo (Richards, 2000) was used to aid in the organisation and coding of the data.

## Results and Discussion

The achievement of broad scale solutions or outcomes addressing land degradation issues is reliant upon ensuring that the actions implemented by the many land owners that make up a region or catchment are effective. In this sense, the effectiveness of action can be determined by the “extent that it leads to the consequence intended in ways that persevere” (Argyris, 2000). However, if the action is to be effective it must also not undermine other beneficial outcomes. This definition of effective action demonstrates the importance of being able to share knowledge of outcomes and actions between scales in order to achieve long-term solutions to land degradation. Due to the cause and effect relationship between these scales, recommended actions need to be ‘effective’ at both the property and



**Figure 1. Location of the study area.**

regional scale for implementation. This can only be achieved with adequate knowledge of the aspirations and actions at both scales of management.

There were a number of insights that are important for improving the knowledge sharing paths between regional and property scales and thus to the improvement of the potential for actions to be effective.

### *1. Gaining a reflection of 'true' actions*

The first of these insights relates to written planning as a means to exchange goals and outcomes due to recent emphasis within Australia on planning for natural resource management at both scales. In particular, there has been significant emphasis on property planning (e.g. DNRM, 2003) as a means to obtain landowner outcomes and activities in regard to natural resource management. Yet, all property case studies within the study, with the exception of one, do not use or envisage using in the future written property management planning as a means toward resource management outcomes. The grazier rationale behind this attitude is that the uncertainty associated with managing natural resources within the Australian tropical savannas makes it often impossible to develop written plans that actually reflect the 'true' actions that are being implemented at the ground level. These actions are often fluid and adaptive. This idea was reinforced by a study on pastoralist's learning in northern Australia that suggested one of the reasons pastoralists do not feel comfortable with writing their plans down is that they don't see this as a flexible approach (Arnott *et al.*, 1999).

Valuable contributions to broad scale outcomes will, however, only be possible through the sharing of knowledge related to 'true' actions (those which actually occur on the ground). Another related aspect noted within each property case study, was the way in which each grazier felt satisfied that they could share and reflect the 'true' actions that they implement that affect natural resources. In all cases, this involved an environment such as that provided with one-on-one or small group interaction whereby they had the opportunity to express their perspective and be listened to, to support verbal explanation with observation of action, and to focus discussion toward specifics of action rather than generalities. Other studies specifically on learning environment preferences of farmers have also found that farmers preferred situations that provide the opportunity to be heard and ask questions, but additionally found that farmers preferred a largely farmer directed context with the opportunity for discussion (e.g. Moore, 1991). Furthermore, as Schön (1995) suggests happens with professionals, resource managers are faced with unique problems and cases that call for 'an art of practice' which can not be taught and therefore, the "knowing is in the action". As a result, it could be expected that the knowledge regarding the action and its relevance to the individual can only be shared through the process of the action.

### *2. Building an environment for mutual trust*

The issue of trust is an important factor in being able to improve the path for knowledge sharing between the different scales. Both the property case studies and the regional investigation identified trust as a key factor in gaining cooperation of individuals and for sharing of knowledge. On the one hand, this trust related to believing that the interests of the individual would be well represented and not undermined for outcomes that are not beneficial to the interests of both the property and regional scales. On the other hand, this trust related to believing that the time and effort involved in the process of sharing knowledge will actually develop into practical and positive actions. Cary (2001) also recognised the advantage of having enough trust to believe that cooperative action will be carried out.

The use of a local, respected person to act as an interface between the two scales was identified as a characteristic to actually achieve a level of mutual trust between the actors at both the property and regional scale that supported constructive knowledge sharing.

### *3. Embracing integration throughout the scales*

The value of integrating knowledge from various disciplines to provide solutions to 'wicked' problems, such as many resource degradation issues, is often recognised at State and Federal Government levels. The same concept could also apply to providing solutions at regional and property levels. However, within this study, it was found that the difficulty associated with filtering of information that is related to resource management is a key constraint to effectively using this information. This is mainly due to the fact that information comes from many different sources, agencies and perspectives. One of the main issues in regard to the ability to filter various types and sources of information relate to human capacity. This includes the individual or organisation's capability in processing large amounts of information to produce locally specific actions that lead to beneficial outcomes at both property

and regional levels. Resource capacity is another main issue that relates to filtering information. This includes both time and money resources that allow the individual or organisation to make valuable contributions to resource management through the integration of this information and application of the newly formed knowledge.

It is generally viewed in the literature that knowledge-building should focus on the use of workshops where effective integration of different forms of information can take place (Smith and Bosch, this volume) The creation of a collaborative learning environment is a useful mechanism for enhancing the knowledge sharing and learning processes. However, there might be an issue that this could lead to revealing the espoused actions, while little attention is given to the actual actions in use and the theories behind these actions.

#### *4. Communicating on equal terms*

There is a strong need to have a continual exchange of desirable outcomes and actions between the property and regional levels. Holding workshops is often used by regional organisations as an appropriate medium for sharing and building knowledge. However, it is not always possible for landowners to attend these workshops because of the remoteness of the Australian rural areas. The issues are also often highly individualistic due to the high diversity of land types. Therefore, communication flow could be enhanced through locally respected people who act as an interface between the different management scales. These people could also help to ensure a two-way flow of knowledge, rather than dominant flow from regional to property level.

#### **Conclusions**

Within this paper, we propose that in order to ensure effective broad scale solutions to land degradation issues then there needs to be a strong link paved between regional and property scales. We also propose that one way in which to strengthen the link between these two scales is through the sharing of knowledge concerning 'real' desired outcomes and activities for natural resource management at each scale. The principles and means through which the exchange and sharing of knowledge may be improved in the Northern Gulf region include; the use of workshops and one to one communication to be facilitated by locally respected people that aid the building of mutual trust and an evolving picture of 'true' actions.

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