

CATCHMENT MANAGEMENT – SETTING THE SCENE

An overview of catchment management models in Australia

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Abstract

There is a wide range of catchment management models in Australia that vary according to the resources and historical framework of the particular catchment and jurisdiction. The Natural Resources Commission (NRC) has reviewed the progress of catchment management in New South Wales over the past six years and has observed the development of significant co-operative relationships, particularly involving water planning.

The NRC's experiences provide useful background to explain the general principles and goals of catchment management. This experience also highlights that continued co-operation between regional resource planners is essential to the 'integration' and ongoing success of catchment management in Australia.

Introduction

This paper sets the scene with the stated objective of:

Building co-operative relationships with land managers and CMAs about water supply aspects of catchment management.

It explains the basic principles of integrated catchment management and reflects on co-operative relationships, giving particular attention to water planning. Therefore, it is structured to answer the following questions about integrated catchment management:

- What is it?
- Why is it important?
- What are our expectations?
- What do we want from it?
- What is working well?

What is Catchment Management?

Catchment management is an evolving system that has developed differently in each state and territory in Australia (Bellamy *et al.*, 2002). There is not one single, ideal model, but the basic principles of 'integrated' catchment management are to:

- Take a holistic approach to the management of land, biodiversity, water and community resources at the water catchment scale;
- Involve communities in planning and managing their landscapes; and
- Find a balance between resource use and resource conservation.

As the 'water catchment scale' is the basic building-block for the holistic approach, water supply is often the central focus of catchment management in Australia. However, an integrated approach also recognises the importance of the communities living in that catchment, and the need for trade-offs between use and conservation of all resources (not just water).

Focussing on water initially, however, integrated approaches to water supply and management began to gain increased international exposure in the 1990s. Notably, one of the four guiding principles developed at the 1992 Dublin Conference on Water and Environment was:

"Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels" (Hooper, 2006).

Within the Australian context, the former Murray-Darling Basin Ministerial Council described integrated catchment management as:

"... a process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment." (MDBMC, 2001)

The common themes of these national and international perspectives on water management are participation, sharing and co-operation. The entity established to co-ordinate co-operative relationships at the water catchment scale is commonly a catchment management authority (CMA). As of July 2011 there were 57 CMAs (or analogous regional organisations) around

Australia, with different structures, names, legislative powers and mandates. However, regardless of the particular framework, each state and territory has recognised the importance of integrated catchment management through its own individual mechanisms.

Why is it Important?

Addressing historic NRM challenges

The development of integrated catchment management around Australia was in response to long-term challenges in natural resource management (NRM). Institutionally and administratively, NRM was fragmented into:

- Voluntary stewardship by landholders – which was crucial given the diffuse nature of NRM problems and solutions;
- Planning arrangements – water, land use, biodiversity, all of which were essential, but were generally managed in isolation from each other;
- Monitoring and evaluation – which was limited in practice.

Natural resource managers also faced a number of cultural challenges that typically blocked consensus at the regional scale:

- The inherent complexity of natural and social systems; and
- Very different "world-views" on prioritisation of NRM funding and actions.

A third challenge has been the lack of organisational stability, as policy and legislation were often amended in response to perceived lack of success. Unfortunately this lack of governance continuity further undermined NRM, setting reform further back.

While these challenges remain current across Australia and need to be addressed by any NRM model in place, the principles of integrated catchment management seek to respond to these challenges in an unfragmented, collaborative and stable manner. Fortunately, in New South Wales and



other jurisdictions in Australia, integrated catchment management models have been able to mature over the past decade in a reasonably stable governance environment that has allowed longer-term strategies to be implemented and their benefits to be realised.

Addressing current and future NRM issues

In addition to addressing historic challenges, integrated catchment management will provide natural resource managers with the best chance of balancing the unprecedented pressures of global population growth, urban development, climate shift, water scarcity, economic growth and other landscape issues that may emerge in the future.

Integrated catchment management is important in addressing these issues through holistic and systematic target setting and planning, such as:

- What environmental outcomes are we seeking?
- What are our natural resource targets and how do they relate to each other?
- How do we combine regulation, planning, land use, infrastructure and natural resource management to deliver our targets?

This target-setting and future planning provides the basis for our expectations of integrated catchment management.

What Are Our Expectations?

Case study: the New South Wales regional model

By way of example of expectation setting, the next two sections of the paper focus on the model of integrated catchment

management in New South Wales, noting that other jurisdictions may have similarly articulated their expectations through their own NRM legislation and policies.

The Standard

The NSW *Standard for Quality Natural Resource Management (Standard)* (NRC, 2005) defines the New South Wales Government's expectations of how resource managers undertake NRM to meet regional and state-wide targets. The government and public clearly expect that NRM decisions, delivered through integrated catchment management will:

- Support investment where it is most needed;
- Aim for the highest quality results; and
- Stand up to public scrutiny.

The Standard is based on the principle that high quality systems and practices are essential to make good decisions that will lead to the best possible outcomes. It also recognises that an adaptive management approach is essential to deal with uncertainties in our constantly changing environment and continually improve decisions as our knowledge grows (for further on adaptive environmental management see (Allan and Stankey (eds.), 2009).

In New South Wales, CMAs are leading the way in meeting the Standard in all areas of their business. While the Standard is mandatory for CMAs, it also provides a benchmark for everyone involved in NRM.

The Standard defines the New South Wales Government's expectations of quality for seven components of NRM:

- *Collection and use of knowledge* –

Use of the best available knowledge to inform decisions in a structured and transparent manner.

- *Determination of scale* – Management of natural resource issues at the optimal spatial, temporal and institutional scale to maximise effective contribution to broader goals, deliver integrated outcomes and prevent or minimise adverse consequences.
- *Opportunities for collaboration* – Collaboration with other parties to maximise gains, share or minimise costs or deliver multiple benefits is explored and pursued wherever possible.
- *Community engagement* – Implementation of strategies sufficient to meaningfully engage the participation of the community in the planning, implementation and review of natural resource management strategies and the achievements of identified goals and targets.
- *Risk management* – Consideration and management of all identifiable risks and impacts to maximise efficiency and effectiveness, ensure success and avoid, minimise or control adverse impacts.
- *Monitoring and evaluation* – Quantification and demonstration of progress towards goals and targets by means of regular monitoring, measuring, evaluation and reporting of organisational and project performance and the use of the results to guide improved practice.
- *Information management* – Management of information in a manner that meets user needs and satisfies formal security, accountability and transparency requirements.

The Targets

The *State-wide Targets for Natural Resource Management (Targets)* set out what resource managers in New South Wales need to achieve to realise the government's goal of:

"Landscapes that are ecologically sustainable, function effectively and support the environmental, economic, social and cultural values of our communities."

These targets provide focus, coordination and a means for tracking progress against the state's expectations in NRM. They encompass biodiversity, water, land and community themes.

Biodiversity:

1. By 2015 there is an increase in native

vegetation extent and an improvement in native vegetation condition.

2. By 2015 there is an increase in the number of sustainable populations of a range of native fauna species.
3. By 2015 there is an increase in the recovery of threatened species, populations and ecological communities.
4. By 2015 there is a reduction in the impact of invasive species.

Water:

5. By 2015 there is an improvement in the condition of riverine ecosystems.
6. By 2015 there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses.
7. By 2015 there is no decline in the condition of marine waters and ecosystems.
8. By 2015 there is an improvement in the condition of important wetlands, and the extent of those wetlands is maintained.
9. By 2015 there is an improvement in the condition of estuaries and coastal lake ecosystems.

Land:

10. By 2015 there is an improvement in soil condition.
11. By 2015 there is an increase in the area of land that is managed within its capability.

Community:

12. Natural resource decisions contribute to improving or maintaining economic sustainability and social well-being.
13. There is an increase in the capacity of natural resource managers to contribute to regionally relevant natural resource management.

What Do We Want From It?

Evaluation and accountability

A key feature of the New South Wales model is the institutionalised mechanism for continual improvement and accountability to investors. Ongoing evaluation is central to the model adopted for NRM, as it is designed to drive adaptive management and provide greater confidence to government investors and the community. The model is grounded by the Standard, which defines good practice and institutionalises evaluation and reporting.

This model seeks to balance centralised government management with regional and community responsibility, through more flexible governance and accountability frameworks promoting innovative and experimental solutions that can be readily adapted in response to new information. This is moving New South Wales away from a prescriptive rules-based system towards an accountability framework that is flexible enough to manage complexity and uncertainty.

Natural Resources Commission reviews

The evaluation and accountability model is unique from a national perspective, as it tasks an independent statutory body – the NRC – to define good practice, conduct formal evaluations and publicly report on catchment management progress.

The NRC's role more generally is to provide independent advice to the New South Wales Government in managing the state's natural resources in an integrated manner. The NRC reviews CAPs and recommends whether they should be approved and audits how effectively these plans are being implemented to meet the Standard and Targets.

The NRC has developed evaluation approaches and gathered evidence through reviews and audits over six years – the most recent findings of which are in:

- *Progress towards healthy resilient landscapes – implementing the Standard, Targets and Catchment Action Plans* (the 2010 Progress Report) (NRC, 2010); and
- *Alignment of water planning and catchment planning* (the Alignment Project) (Hamstead, 2010).

What do we want from integrated catchment management?

The NRC's 2010 Progress Report focuses on the New South Wales regional model; however, the main findings of the report demonstrate elements of integrated catchment management that are consistent Australia-wide:

1. Land stewardship

Integrated catchment management is an effective mechanism for supporting land managers to voluntarily manage their land better for both public and private benefit. Giving regional communities a more direct say in the complex task of reconciling community needs with ecosystem health is succeeding where previous top-down approaches have failed.

2. Project Delivery

CMAs are well positioned to deliver

on-ground projects. Taking a holistic, landscape approach improves the likelihood that they will produce good results in the longer term. In NSW and elsewhere around Australia, CMA project delivery has produced observable resource condition improvement at the site scale over the past decade, a period of unprecedented drought in much of the continent.

3. Institutional stability

Integrated catchment management has provided relative continuity, in a field that has typically changed regularly. This promotes capacity building and adaptive management within regional institutions and communities.

4. Improved landscape knowledge

Integrated catchment management has promoted a shift in thinking on NRM, which is moving away from the conservation-based thinking of restoring landscapes to **pre-1750 [is this correct?]** conditions. Instead, there is a growing understanding that landscapes are made up of human communities and biophysical processes that interact and shape each other and are constantly changing.

5. Local decision making

Integrated catchment management allows local communities to be more directly involved in NRM. Environmental, social and economic challenges that frustrate national and international policy efforts are better addressed and solved at the local and regional scale.

What 'more' do we want from it?

The regional model has progressed towards integrated catchment management and has created benefits for NRM. The NRC has recommended areas of further improvement to the New South Wales Government to fully implement integrated catchment management:

1. Implement whole-of-government and community catchment planning.
2. Improve science and knowledge.
3. Implement adaptive management across government.
4. Match funding to landscape need.
5. Design sound policy to complement stewardship.

Achieving future improvements through co-operation

With the foundations of integrated catchment management in place, the priorities for the future that the NRC has recommended will require continued co-operative relationships between land

catchment management

managers, CMAs, regional communities, industry (including the water industry) and all levels of government.

To achieve this, the levels of trust and co-operation will need to deepen significantly, especially as organisations face tough budgetary times where the natural inclination is to refocus on core tasks, rather than collaborate with other processes.

However, natural resource managers will only be able to maintain (and improve) healthy rivers that support multiple values across the catchment by integrating catchment planning and management, rather than focussing solely on water supply aspects of catchment management. CMAs (and their equivalent regional based organisations around Australia) have a critical role in facilitating relationships and brokering between government and the community to manage the landscape as a whole.

What Is Working Well?

The findings of the *2010 Progress Report* (noted earlier) highlight the strengths of CMAs in New South Wales in engaging communities and delivering on-ground works to deliver local resource condition improvements. Further details of CMA achievements are shown in the NRC's audits; however, this paper will focus on successful relationship building that has occurred.

Clearly there are many good examples of NRM and integrated catchment management practice around Australia that reflect productive co-operative relationships within catchment management and an understanding of the inter-relationships of social, community and ecological systems.

However, this paper will focus on two recent examples from New South Wales, which again provide universal principles that will be familiar to natural resource managers in other jurisdictions. The first is a very successful example of co-operation between water and catchment planners (the Alignment Project in the Hunter-Central Rivers CMA), while the second builds on this co-operation across other aspects of catchment planning (the recent Pilot CAP upgrades in the Namoi and Central West CMAs).

1. Alignment Project in the Hunter-Central Rivers CMA

One of the most interesting and exciting recent developments in integrated catchment management has been the National Water Commission-funded project to align water planning and catchment planning (Hamstead, 2010).

In summary, all Australian states and territories have planning processes in place for:

- The management and sharing of surface water and groundwater resources through regulation and investment; and
- The maintenance and improvement in the condition of land and water resources and ecosystems through investment incentives and regulation.

These actions are usually conducted under parallel and disconnected management processes, as is the case in New South Wales, with the separate *Water Management Act 2000* and the *Catchment Management Authorities Act 2003* – which weren't specifically drafted to operate together (in fact one of the barriers to proper integrated catchment management is the limited control CMAs have over water).

Therefore, the National Water Commission funded a project for state and regional entities to explore the benefits and barriers to water planning and catchment planning processes working together. The NRC, in partnership with the Hunter Central Rivers CMA and two former NSW Government Departments – Environment, Climate Change and Water and Planning – trialled a process through which both plans could be based on a common values and risks assessment of aquatic assets.

Encouragingly, this regionally delivered project, based on Commonwealth funding, found that a strong 'alignment' of CAPs and New South Wales water sharing plans (WSP) was possible within current resources and with current institutional structures. The trial demonstrated that the following actions are likely to make the biggest difference to future alignment:

- There should be jurisdictional policies and objectives to manage freshwater aquatic ecosystems that apply to both water allocation and catchment plans.
- There should be governance arrangements supporting ongoing co-ordination between agencies at state and regional levels. This would assist in developing plans and implementing actions that contribute to shared objectives.
- Freshwater aquatic ecosystem condition, value and risk assessments should be done in a single, shared process.
- Spatial representation of assessments

should be sufficiently detailed to inform within-region prioritising decisions for both types of plans.

- A paired program logic map should be developed for both planning processes in each region. It should include shared freshwater aquatic ecosystem objectives that are aligned through shared, spatially defined priorities to protect and restore freshwater aquatic ecosystems.

This alignment is a crucial first step to the full integration of water and catchment planning that would improve regional resource management through reduced duplication and better co-ordination.

Benefits of building co-operative relationships

The Alignment Project was an important piece of evidence for the NRC's findings in the 2010 Progress Report.

It is a recent and compelling example of the benefits of:

- The use of a common information base to plan from; and
- Agreement on values so that different organisations can go about their business confident in shared objectives.

The project was an important practical example of breaking down traditional planning silos, and to start seeing and managing landscapes as complex and connected systems. The management process itself is critical, as it promotes collaboration, institutional efficiencies and more cost-effective work programs. The process requires time, effort and commitment, and may struggle initially through differences in data, language and targets. However it is the alignment of these differences that ultimately contributes some of the greatest benefits.

Encouragingly, following this NSW-based trial, the National Water Commission recommended that the alignment framework be rolled out nation-wide. Within New South Wales, the benefits of this alignment have been promoted through the pilot CAP upgrades undertaken in the Namoi and Central West CMAs recently.

2. Pilot CAP upgrades in the Namoi and Central West CMAs

From 2004, CMAs in New South Wales developed the first round of CAPs, largely based on the earlier community-based Blueprints (which were predominantly CMA and community documents with less government involvement).

In 2006, the NRC assessed the first

round of CAPs and found they were reasonable given the maturity of CMAs and the regional model at the time. When the NRC approved the CAPs, it recommended that the next generation of CAPs should become whole-of-government CAPs.

In 2008, the NRC in partnership with the New South Wales Government commenced a pilot for upgrading CAPs in the Central West and Namoi CMAs. These pilots have been successful, with:

- Much stronger evidence base;
- Clearer strategic thinking;
- Improved communication and accessibility;
- Much better prioritisation and change management through resilience thinking, and most relevantly to this paper;
- Increased collaboration.

The remaining 11 CMAs in NSW are currently commencing the upgrade of their CAPs, which are to be developed by March 2013 as a priority action under the state plan *NSW 2021* (New South Wales Government, 2011). The NRC is supporting these upgrades through the release of the *Framework for assessing and recommending upgraded catchment action plans* (CAP Assessment Framework) (NRC, 2011), which not only reflects the lessons learned from the Pilot CAP Upgrades, but also contains three 'criteria' that set out the NRC's expectations for upgraded CAPs (and explains how the NRC will assess them):

1. The CAP was developed using a structured, collaborative and adaptable planning process – the process in developing the plan, building strategic capacity and engendering ownership is more important than the final document itself.
2. The CAP uses best available information to develop targets and actions for building resilient landscapes – being clear on planning targets and putting the new conceptual framework of 'Resilience thinking' into practice. (See further on resilience at (Walker and Salt, 2006; Bennett, 2003; Walker *et al.*; 2009 and Chapin *et al.*, 2009).
3. The CAP is a plan for collaborative action and investment between government, community and industry partners – on the basis of the encouraging outcomes of the Alignment Project (integrating NRM policy framework at the regional scale and greater collaboration with partners in NRM).

Conclusion: Building Co-Operative Relationships in Catchment Management

The experiences highlighted in this paper show that the current Catchment Management Authorities (and equivalent regional bodies around Australia) are gaining sufficient institutional maturity and stability to make integrated catchment management feasible.

The development of catchment management over the past two decades, and its encouraging results in the past few years, have shown that building co-operative relationships is a difficult, lengthy, but necessary part of its integration. Through this paper, the following lessons for co-operative relationships can be distilled:

1. *Whole of government, whole of community* – A collaborative approach should increase the effectiveness of both the CMA and its partners, and minimise costs in working towards common objectives.
2. *Collaboration is hard* – Conflict between government and community expectations is inevitable. Resolving differences will not always be possible, but attempts to collaborate are the first step in an ongoing process.
3. *Alignment with existing plans* – The Pilot CAPs and other projects have demonstrated a methodology for mapping areas of commonality and conflict between the CAP and other related NRM plans. Alignment at the strategic scale is an important precursor to collaboration and co-ordination on specific actions.
4. *Spatial representation* – There is an inherent power of maps in communication – spatial representation is an important characteristic and tool of upgraded CAPs.
5. *Agreed roles and responsibilities* – The test of the success of the planning process is the extent to which the key delivery partners have agreed to be assigned responsibility for CAP implementation. Agreement is often easier at the strategic level (visions and goals) than at the operational level (actions).

The Author



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