

DEVELOPMENT OF WATERSHED MANAGEMENT IN NEW SOUTH WALES, AUSTRALIA: A COASTAL PERSPECTIVE

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INTRODUCTION

Watershed management has become a prominent approach to natural resource management (NRM) in Australia and elsewhere. In the Australian State of New South Wales (NSW), catchment management – the NSW watershed management initiative – has been in place both in coastal and non-coastal areas for nearly two decades. In coastal areas, it is suggested that catchment management could play an important role in coastal and marine issues (NSW Coastcare et al., 2004; Zann, 1996), as the Australia's coastal and marine environments have, in general, been affected by watershed-based activities (see e.g., Zann, 1996). Such a role would, however, require institutional changes, as catchment management has not been specifically designed to address coastal and marine issues. Furthermore, catchment management itself has been challenging to deliver NRM, even in non-coastal areas. Examining the development of institutional arrangements for catchment management can help developing a better understanding about the conditions necessary to improve current arrangements and the potential challenges to eventual reforms. This paper describes the development of institutional arrangements for catchment management in NSW and its contextual factors, and discusses institutional challenges towards prospective coastal catchment management. Implications from the Australian context provide insights that warrant consideration in other regions and jurisdictions.

METHODS

This paper was primarily based on the main concepts and features of the Institutional Analysis and Development (IAD) framework – an established scientific theoretical framework commonly used to investigate the governance of common-pool resources (Ostrom, 1999). Particularly useful was the IAD analytical definition of institutions as sets of rules in a hierarchical and nested system. Sources of information and data for this study included relevant documents, such as legislation, reports, reviews, as well as consultations with some of the individuals and organisations involved with catchment management in NSW.

RESULTS AND DISCUSSION

Development of Catchment Management in NSW

Institutions can be defined in terms of formal rules and informal norms, which constrain or foster human behaviour, and are adopted by individuals operating within or across organisations (Ostrom, 1999). In examining the development of institutional arrangements for catchment management in NSW, it is important to distinguish multiple levels of institutional rules. These levels comprise a nested system, where outputs of the higher levels affect the rules at the lower levels. At the *constitutional-choice level*, the highest hierarchical level, policies and legislation that affect catchment management are made and revised. Such policies and legislation provide the rules for decision-making at the *collective-choice level*, where stakeholders – in a catchment management committee, for instance – engage in planning and management activities to address catchment management issues. The outcomes of such activities, e.g., a management plan, determine how on ground activities to tackle NRM problems can be carried out at the *operational-choice level* by resource users, local groups, or other parties involved in implementation.

At the constitutional-choice level a number policies and legislation affect catchment management in NSW. Similarly, at the collective-choice level, various agencies and other NRM bodies influence how resources are used and managed at the operational-choice level. In this paper, however, the focus is on specific catchment management policy, and the catchment management bodies established under such policy.

The constitutional-choice level

The concept of catchment management emerged in the early 1980s with enthusiasm within the NSW Government. In 1984, a steering committee was established to make recommendations about catchment management as a new government initiative and later an Inter-Departmental Committee on catchment management was created (Burton, 1986). In 1986, the catchment management policy was formally endorsed by NSW government. Such policy aimed at ensuring the coordinated use of land, water, vegetation and other natural resources on a watershed basis, emphasising community participation and voluntary implementation (Martin et al., 1992). In 1989, the *Catchment Management Act* was passed and formalised the first state-wide statutory catchment management policy in Australia. In 1996, the NSW government commissioned a review of catchment management, comprising two stages: (a) an independent review undertaken by consultants (AACM, 1996), which provided the basis for (b) a review conducted by the NSW Department of Land and Water Conservation (Verhoeven, 1997). As a response to the review, the *Catchment Management Regulation* was enacted in 1999, introducing changes in the catchment management framework. Recently, following a major reform of the State NRM system, further changes were introduced by enacting the *Catchment Management Authorities Act* in 2003, which also repealed both the *Catchment Management Act* and the *Catchment Management Regulation* (NSW, 2003).

The collective-choice level

Following the adoption of the catchment management policy in the mid 1980s, the first catchment management groups began to emerge in NSW (Burton, 1986; Martin et al., 1992). These groups comprised mostly locally or regionally based staff from State government agencies and local government (Martin et al., 1992). Such groups were the precursors of the Catchment Management Committees (CMCs) established later by the Catchment Management Act 1989. The CMCs and Catchment Management Trusts (CMTs) constituted regional bodies responsible for coordinating catchment management at the watershed level. One of the main differences between the two bodies was that the CMTs could raise and administer funds, and undertake on ground works. Over forty CMCs represented, however, the prevalent catchment management bodies in NSW. Each CMC was formed by a majority of resource users or land holders, plus environmental interests, local and state government representatives, appointed by the Minister of Land and Water Conservation. Staff and other support were provided by the NSW Department of Land and Water Conservation, the then leading State agency for catchment management. Despite being statutory, the CMCs were advisory bodies only, e.g., the CMCs strategies/plans had no legal authority; implementation relied mostly on voluntary action, and to some extent on the provisions of related policies. The State Catchment Management Coordinating Committee provided coordination for the CMCs and CMTs across the State.

The Catchment Management Regulation 1999 replaced the CMCs with 18 Catchment Management Boards (CMBs) (NSW, 1999). Coastal CMBs had jurisdiction over larger areas and, therefore, had a more regional focus than the former coastal CMCs. The areas of coastal CMBs also extended to 3 nautical miles seaward, encompassing the State waters. The membership composition of the catchment management bodies was modified to include representatives from the aboriginal community, in addition to representatives from resource users, nature conservation, local and state government. The short life of the CMBs was dedicated primarily to the development of an integrated catchment management plan (the Catchment Blueprint) for their respective areas, which was accomplished shortly before their termination.

In early 2004, the CMBs were disbanded and 13 Catchment Management Authorities (CMAs) were established under the Catchment Authorities Act 2003. Most of the coastal CMAs operate within even larger areas than the coastal CMBs. The CMAs are independent bodies that report directly to the Minister for Natural Resources and Minister for Infrastructure and Planning, and no longer under the responsibility of a State government agency, as were the CMCs and CMBs. Each of the CMAs' board comprises between five and seven members from the community, appointed by the Minister based on their knowledge and skills, rather than on representation of particular interest groups. The CMA board members are employed part time by the NSW Government, whereas, in the past, members of the catchment management bodies participated mostly on a voluntary basis. Unlike the former catchment management bodies, the CMAs are better resourced both in terms of human resources and funding. As part of the CMAs structure, a general

manager and other staff are employed. Additional corporate support services, such as financial management and legal support are provided by the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR, 2003). The CMAs have an initial budget of \$ 436.5 million (USD \$ 336 million approx.) over four years (DIPNR, 2004), of which \$ 120 million are committed to native vegetation and targeted on-farm incentives (DIPNR, 2003). In addition to an advisory role, similar to their predecessors, the CMAs have governing and operational roles, including the development of plans, investment, on ground works, community education and support, and approval of property vegetation plans (NSW, 2003). The structure and roles of the new CMAs may suggest that catchment management institutions in NSW are moving from a community-based model towards a quasi-government system.

The operational-choice level

The operational choice level of catchment management in NSW has since its initiation been comprised mostly by local voluntary groups, such as Landcare, Bushcare; farmers and land managers; as well as government agencies. The local groups have, in general, been regarded as the main means to implement strategies and plans developed by the catchment management bodies, by delivering on ground activities.

Catchment management has, during its development, presented a number of inadequacies (see e.g., AACM, 1996; Bellamy et al., 2002). The institutional reforms described above, both helped overcome some of these inadequacies, and aggravated and created some others. Issues such as geographic scope, who takes part in decision-making processes, and community participation, for instance, are still open to criticism. For example, whereas a broader regional scope for catchment management allows for a better strategic approach, it can, on the other hand, preclude genuine local community participation (Ewing, 2003). Skill-based appointment of stakeholders to take part in decision-making processes, is suggested by some authors (e.g., Connor and Dovers, 2004) to be, in certain cases, a potentially convenient way for the government to maintain the control, by determining the relevant expertise to be part of the process. In the state of Victoria, for instance, conservation groups argue that CMAs are dominated by the interests of primary producers (Ewing, 2003). Similarly, a majority of resource users and landholders was, in the past, a requirement of the catchment management legislation in NSW (NSW, 1989). Given that the latest reforms in NSW are very recent, it is unreasonable, at this stage, to make assumptions whether these suggestions will prove true.

Contextual Conditions

The IAD framework suggests that three categories of interrelated contextual conditions, i.e., characteristics of the biophysical environment, the institutional rules in use, and the attributes of the community, influence the interactions and outcomes in a decision-making situation (Ostrom, 1999). Accordingly, the contextual conditions that have influenced catchment management in NSW can be related to these three general categories of the IAD framework.

The emergence of catchment management as State government policy was primarily associated with the *characteristics of the biophysical environment*, i.e., the perception of severe environmental problems in rural areas, such as soil salinity and erosion, and the *institutional rules in use*, i.e., the realisation that the sectoral approach to such environmental problems was ineffective. The support of influential individuals within NSW Government helped advancing the concept of catchment management in the State government political agenda (Burton, 1986; Martin et al., 1992). Given the importance of primary production to the Australian economy, rural communities have generally had their policy preferences considered at policy/decision-making arenas. Rural interests have historically been the main interests involved in catchment management in Australia (Bellamy et al., 2002). These *attributes of the community* – along with the nature of the NRM problems and the institutional rules, as noted above – have, similar to other Australian states (Bellamy et al., 2002), driven the rural focus of catchment management in NSW, with emphasis on agriculture production and protection and enhancement of environmental qualities that support such production.

A number of other factors can lead to institutional change, such as changes of government, of policy fashion, dissatisfaction with the status quo, response to emerging issues, and response to institutional learning. Various authors have stressed the need for institutional learning (e.g., Connor and Dovers, 2004), particularly, because the contemporary models of environmental governance, emphasising coordinated/integrated approaches, are regarded as experiments. In addition, learning processes are critical to overcoming the constraints of the boundedly rational decision-maker model of the IAD framework (Sabatier et al., 2005). Further and specific analysis is, however, required to determine to what extent the changes observed in catchment management institutions in NSW have been a result of such learning processes.

Prospects for Coastal Watershed Management

The rural focus of catchment management has limited application to urban and urbanising catchments (AACM, 1996; Macpherson, 1997), such as coastal catchments. In addressing coastal and marine issues there are limitations in the operational-choice (Fidelman et al., 2004b) and collective-choice rules (Fidelman et al., 2004a). At the collective-choice level, for example, scope, position, boundary, and information rules would require modification to: (a) specify a coastal and marine focus; (b) include direct involvement of coastal and marine interests, including expertise; and (c) establish effective ways for interaction between decision-makers and coastal and marine stakeholders (Fidelman et al., 2004a). This can be achieved by changing the rules at the next higher level of rule making (i.e., the constitutional-choice level).

Changing the rules at the constitutional-choice level is, however, not easy and usually has much higher transaction costs, as it involves more people with more diverse interests (Sabatier et al., 2005). The concepts of social policy learning and political learning (May, 1992) are particularly useful in this case. Problems

addressed by catchment management would need to be reframed for coastal areas, i.e., the policy elites' beliefs need to be modified to recognise that important coastal and marine issues requiring action at the catchment management level exist and need to be addressed (*social policy leaning*). Such normative change would depend, in part, on the availability of scientific information to support the argument for coastal and marine issues, the perception of the severity of the coastal and marine problems, and better understanding of cause-effect relationships, among others. In this context, coastal and marine stakeholders (e.g., local community groups, researchers, environment organisations, government agencies etc.) would have an important role, particularly by realising how to better advance coastal and marine issues in the State NRM/catchment management political agenda (*political learning*), so that eventually their concerns get addressed by policy/decision-makers.

CONCLUSIONS

This paper has examined the development of institutional arrangements for catchment management in NSW and its contextual factors, and discussed institutional challenges for a prospective coastal watershed management. Catchment management has undergone institutional changes since its initiation in the 1980s. However, reforms that entail significant role in coastal and marine issues are yet to occur. Changing catchment management institutions, so that coastal and marine issues are effectively addressed, represents a significant challenge, as it implies reforms at NSW highest levels of policy/decision-making.

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REFERENCES

- AACM, 1996. Review of Catchment Management in New South Wales. Final Report, Department of Land and Water Conservation, Sydney.
- Bellamy, J., Ross, H., Ewing, S. and Meppem, T., 2002. Integrated Catchment Management: Learnings from the Australian Experience for the Murray-Darlin Basin. Overview Report, CSIRO Sustainable Ecosystems, Canberra.
- Burton, J.R., 1986. The Total Catchment Management Concept and its Application in New South Wales, Hydrology and Water Resources Symposium. Griffith University, Brisbane, pp. 307-311.
- Connor, R. and Dovers, S., 2004. Institutional Change for Sustainable Development. Edward Elgar Publishing, Cheltenham, 251 pp.
- DIPNR, 2003. Natural Resource Management Reform - A New Approach to Natural Resource Management. Department of Infrastructure, Planning and Natural Resources.
- DIPNR, 2004. Natural Resource Management \$436.5 Million Boost, Media Release - Ministers Office, Sydney.
- Ewing, S., 2003. Catchment Management Arrangements. In: S. Dovers and W. River (Editors), Managing Australia's Environment. The Federation Press, Sydney, pp. 393-409.

- Fidelman, P.I.J., Morrison, R.J. and West, R.J., 2004a. Catchment Management Planning in Coastal Areas: Some Preliminary Insights from New South Wales, Australia, Coastal Zone Asia Pacific, Brisbane, Australia, pp. 221-226.
- Fidelman, P.I.J., Morrison, R.J. and West, R.J., 2004b. Coastal Issues in Regional Natural Resource Management Plans: The Case of the New South Wales Catchment Blueprints, Coast to Coast '04, Hobart, Australia.
- Macpherson, D., 1997. Taking Urban ICM Seriously, 2nd National Workshop on Integrated Catchment Management, Australian National University, Canberra.
- Martin, P., Tarr, S. and Lockie, S., 1992. Participatory Environmental Management in New South Wales: Policy and Practice. In: G. Lawrence, F. Vanclay and B. Furze (Editors), Agriculture, Environment and Society. MacMillan, Melbourne, pp. 184-207.
- May, P.J., 1992. Policy Learning and Failure. *Journal of Public Policy*, 12(4): 331-354.
- NSW, 1989. Catchment Management Act, New South Wales, Australia.
- NSW, 1999. Catchment Management Regulation, New South Wales, Australia.
- NSW, 2003. Catchment Management Authorities Act, New South Wales, Australia.
- NSW Coastcare, Ocean Watch Australia and Nature Conservation Council of NSW, 2004. Incorporating Coastal and Marine Issues into Catchment Action Plans, NSW Coastcare, Ocean Watch Australia, Nature Conservation Council of NSW, Sydney, (Draft).
- Ostrom, E., 1999. An Assessment of the Institutional Analysis and Development Framework. In: P. Sabatier (Editor), *Theories of the Policy Process (Theoretical Lenses on Public Policy)*. Westview Press, Boulder.
- Sabatier, P., Leach, W., Lubell, M. and Pelkey, N., 2005. Theoretical Frameworks Explaining Partnership Success. In: P. Sabatier et al. (Editors), *Swimming Upstream: Collaborative Approaches to Watershed Management*. MIT Press, (forthcoming).
- Verhoeven, T.J., 1997. Status Report of ICM in New South Wales, 2nd National Workshop on Integrated Catchment Management, Australian National University, Canberra.
- Zann, L.P., 1996. The State of the Marine Environment Report for Australia (SOMER): Process, Findings and Perspectives. *Oceans & Coastal Management*, 33(1-3): 63-86.

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