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How to harness the full potential of integrated catchment management as a pathway to sustainability

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Introduction

Water resource management authorities globally are increasingly adopting regional ecosystem approaches and reflexive governance as pathways to sustainable development (Paton et al., 2004; Vos et al., 2006). An integrated collaborative approach to natural resource management at the catchment scale is a strong theme in the recent literature (e.g., Lovell et al. 2002; Painter & Memon, 2008). New Zealand's Resource Management Act (RMA), enacted in 1991, is a devolved planning mandate for integrated natural resource management exercised by elected regional councils. The territorial jurisdiction of regional councils established in 1988 was purposely defined on the basis of groups of large water catchments (including groundwater aquifers) to facilitate an integrated approach to natural resource management. Integrated management of water allocation, water quality and related land management are primary functions of regional councils. However, regional councils have shied away from exercising their devolved integrated water planning mandate at the sub-regional catchment scale. Instead, provisions of first generation regional water plans tend to be framed region-wide in scope. In some plans, water quality and quantity issues are addressed separately with limited linkages, a reflection of poor integration.

Growing cognisance of planning at the catchment scale is a recently re-emergent phenomenon under the RMA planning regime[5]. Regional councils, including the Canterbury Regional Council, are according a much higher priority to this as a means to avoid and resolve water conflicts. The community engagement and strategic planning provisions of the new Local Government Act 2002 (LGA)[6] and the 2005 RMA amendments[7], embedded in a wider cultural shift from *government* to *governance,* are improving the potential for integrated water resource management with community engagement.

A need for a greater catchment focus has become increasingly evident during the last decade for a number of reasons: to respond to potential adverse impacts on land and water connected with intensification and expansion in the farming sector; growing water demand and conflict between in-stream and out-of stream water users; dissatisfaction with predominantly top-down hierarchical approaches by regional councils to address these concerns; and demands by Māori, the indigenous inhabitants, to be actively involved in governance of water resources. These forces exemplify characteristics of a 'wicked' environmental problem (e.g., Weber & Khademian, 2008a) and have precipitated a gradually widening appreciation of integrated collaborative planning of land and water resources at a catchment scale.

One of the objectives of the Lincoln Ventures (LVL) led Foundation for Research Science and Technology funded research programme is to identify challenges for integrated catchment management (ICM) in New Zealand under the RMA regime and to suggest a way forward. The 'human dimension' of ICM research is not as well established or recognised in New Zealand as bio-physical research is. There is a need for improved social science understanding of catchment governance focused on context, perceptions and interrelationships amongst and between user groups, communities, regulators and other stakeholders from place based, multi-scalar perspectives. The LVL project is designed to contribute to that.

The detailed research findings from our study are reported in a forthcoming publication (Memon, Painter & Weber, forthcoming). In this article, we provide a brief summary and recommendations.

ICM challenges in NZ

Arguably, the RMA constitutes a logical planning framework for ICM, with the sole purpose of the Act defined in terms of sustainable management of natural and physical resources. Yet, notwithstanding this, and in spite of growing public concerns about issues of water quality and quantity in the face of land use intensification and climate change implications, and notwithstanding a recent proliferation of an array of ICM type initiatives, our considered assessment is that ICM has not featured strongly in the way regional councils have interpreted and implemented their devolved RMA mandate relating to water management. Regional councils have prepared plans for water allocation, water

[5] A focus on catchment based planning by Catchment Boards, as special purpose *ad hoc* authorities, was more evident under the Water and Soil planning regime preceding the adoption of the RMA planning regime in 1991. The individual Catchment Boards were amalgamated into larger Regional Councils in 1988.

[6] The LGA 2002 empowers local authorities to promote sustainable well-being of communities.

[7] The amendments made to the RMA in 2005 re-affirm the role of regional councils to take a strategic planning approach to allocation and management of water resources.

quality and land use on a primarily 'whole-of-administrative-region' basis, but not many have prioritised water resource planning for water allocation and water quality at the catchment scale. Consequently, water resource planning tends to be more 'top-down' than 'bottom-up', with limited integration between allocation, quality and land use provisions on a specific catchment basis[8].

Our research findings regarding recent ICM initiatives have highlighted the following constraints:

Strategic spatial planning
In the context of the RMA's devolved planning framework, a strategic spatial planning approach to water resource management at both regional and catchment scales is a key imperative to promote the sustainable management purpose of the Act via the integrated natural resource management function delegated to regional councils (Memon & Skelton, 2007). The strategic and integrated attributes of planning have been generally lacking in regional council plan making and implementation practices.

Silo-mentality
Prevailing poor professional integration ('silo-mentality') within regional councils, between statutory and non-statutory planning, and natural science and social science components of plan making and implementation are a significant constraint. Lack of integration of multi-disciplinary expertise, combined with the lack of opportunities to learn from other relevant processes are key constraints in linking voluntary ICM plans with statutory regional plans.

Lack of regional council support for ICM
ICM initiatives to date in New Zealand tend to be *ad hoc,* reliant on availability of funding and personal initiative. Our investigations highlighted the limited staff and other resources allocated to catchment initiatives by regional councils. Funding for planning at the catchment scale is a constraint for many regional councils, particularly those who don't have access to revenue from sources other than land taxes (e.g., shares in regional council owned port companies).

Lack of support and capacity building by central government
Even though central government has significantly devolved water resource management responsibilities to local government, it has provided limited policy guidance or direct support to build local capacity and political commitment. Catchment level projects often do not continue long enough or with sufficient funding to ensure that successes in particular areas were able to be built on and integrated, either horizontally (between catchments) or vertically (from the individual through to the national level).

Clarification of Māori property rights
A related national context issue pertaining to ICM in New Zealand is the role of Māori as Treaty partners with the Crown in management of natural resources such as water. As with the recent settlement of fishery quotas, Māori claim ownership of water resources under the terms of the Treaty of Waitangi negotiated between the Crown and Māori in 1840. This claim has yet to be lodged and adjudicated, and uncertainty in the minds of regional council officials and farmers about future access to water by non- Māori is perceived as a barrier to collaboration by some respondents.

Institutional fragmentation
There are two aspects to concerns about institutional fragmentation: division of planning responsibilities between regional councils and territorial local authorities (district councils); and difficulties of collaboration with central government agencies on a 'whole-of-government' catchment basis.

Information
A constantly changing system with a wide range of time lags between inter-connected causes and effects introduces significant uncertainties into ICM, which can easily inhibit progress (e.g., Weible, 2008). Uncertainty is considered a key ICM challenge as it can affect whether stakeholders participate, the manner in which they participate, the ability of multiple institutions and disciplines to hold meaningful conversations, and the prioritisation of resourcing to reduce constraining uncertainties.

Participation
Inclusive community participation is important for reasons of democratic legitimacy and practical considerations related to problem solving and decision implementation (e.g., Stiftel & Scholz, 2005). Traditional consultative local authority processes are a back-to-front way of working with the community, in that the initiative was identified first, and the participation sought second.

An adversarial climate
A further challenge is the treatment of science and other expertise in an adversarial manner. This is considered to be a key hindrance to actualising the RMA intent of integrated management of air, water and land. A planning approach limited to managing environmental effects of individual consents in a first-in-first-served process has provided

[8] A significant recent exception to the commonly practiced 'plan, notify and defend' approach is the catchment plan for Lake Taupo (see Budd et al. 2009).

incentives for water permit applicants to contest regional council decisions in courts of law on veracity of expert evidence (Memon & Skelton, 2007).

Leadership

One can draw a distinction between leadership and facilitation. It is deemed that leadership is required from all participants in an ICM process, as all are required to participate in a manner that considers the interests of the stakeholders they represent at the same time as the interests of the wider community. While leadership by senior regional council officials is considered highly significant to enable and support a culture conducive to ICM, long term ICM success relies principally on community leadership.

Facilitation requires a person or persons with sufficient trust and respect from participants to keep the process moving forward. The lack of trained and resourced facilitators is a significant barrier to effective stakeholder participation.

Enhancing the potential of integrated catchment management

The interrogation of ICM practices in New Zealand from an institutional perspective raises a number of policy implications.

The barriers to ICM identified in this paper can be addressed in a number of inter-related ways:

- International agencies such as the EU, New Zealand's major trading partner, could encourage the New Zealand government to take its environmental obligations more seriously because of possible risks of European consumer boycotts and the threat to New Zealand's 'clean-green' image. Likewise, the OECD, which periodically audits environmental performance of member countries, could pressure New Zealand government to take its international Treaty obligations pertaining to biodiversity and wetland protection more seriously.

- A national water policy should take full cognisance of the significance of ICM as a means to achieve the sustainable water management purpose of the Act and the pivotal role of regional councils in this respect. A joint funding formula with regional councils to support ICM practices should be part of the national policy.

- The issue of Māori water entitlements and their constitutional role in water governance needs clarification. The recently negotiated agreement between the Tainui tribe and the Crown for the joint governance of the Waikato River may provide a potential role model for future water governance arrangements.

- Regional council planning instruments (regional policy statements and plans) should embrace a sub-regional ICM dimension as a key attribute of region-wide water strategies to address inter-related issues of water allocation, water quality and land use. ICM initiatives and practices should be linked to regional water plan strategic objectives and policies. This will enable top-down and bottom-up approaches to more easily complement each other.

- At the catchment scale, to the extent that certain enabling, antecedent conditions are in place, collaborative participatory ICM practices will be more likely to succeed. Ideally, appropriate enabling conditions include strong social capital (Putnam, 2000), high cultural or belief homogeneity (Sabatier et al., 2005), an economy *not* dominated by extractive industries (Lubell, 2005), and good scientific knowledge about the resource problems at issue (Lubell, 2005; Sabatier et al., 2005; Weber, 1998). If such conditions are not present, however, a specific pragmatic, strategic approach to early problem solving, a series of initiatives that focus participants on shared values, common ground, and collective benefits, and a series of specific leadership practices can help to facilitate the transition to a successful collaborative institution (North, 2005; Weber & Khademian, 2008b; Weber, 2009).

- Once the enabling conditions are in place, it is important to craft a network-based culture grounded in a credible, effective commitment to collaboration that increases the certainty that participants' stakes will be treated fairly and as legitimate claims within the broader context of sustainability goals. This requires facilitation from collaborative capacity builders (Weber & Khademian, 2008a) with a relevant set of skills, traits and reputation.

- Long term, measurable progress requires all stakeholder groups of place, interest and regulation to participate throughout ICM processes at a level that leads to mutual accountability for process outcomes. More progress is required in this area, in particular through finding participation incentives for those doing well out of the current system and offering participation opportunities for those struggling in the current system.

- Monitoring of performance toward agreed catchment targets or within agreed tolerances requires regular reporting on a comprehensive, measurable, understandable and achievable set of performance indicators. Integrated indicators that hide subjective weightings should be avoided as these weightings change across a community and over time (e.g., Painter et al., 2007). The use of the internet with information designed to a reading age of 12 is recommended to encourage wide participation.

While the implementation time frame for some of the suggestions is long-term, others can be implemented sooner.

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