

CAPACITY BUILDING IN THE WATER SECTOR IN SOUTH AFRICA: IMPLICATIONS OF THE NATIONAL WATER ACT AND THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT.

Johannesburg, October 2000

Authors:

Dr Heather MacKay, Department of Water Affairs and Forestry
Prof Kevin Rogers, University of the Witwatersrand

BACKGROUND

This paper examines, briefly and qualitatively, the demands which new legislation will place on water resource managers, in terms of new skills and capacity which are required. The actual quantitative human resource requirements will depend very much on the pace and scale of implementation, which is planned, according to the national water policy, to be undertaken in a “phased and progressive manner.”

The Water Law Principles of 1996 clearly set the direction for the future of water resources management. The twin threads of sustainability and equity run through the Principles, the National Water Policy of 1997 and the National Water Act (NWA: Act 36 of 1998). The shift in emphasis to integrated management of water resources, on an ecosystem basis, requires the introduction of a new set of tools for resource management, tools that are flexible, protective and can take account of extreme differences within South Africa, both in socio-economic conditions, and in natural variability of aquatic ecosystems.

The move to resource management has been a gradual one over the last ten years, driven by need, as South Africa approached the limits of new development of water resources and was forced to begin a shift to careful management of existing available resources. To support this change, new tools and new ways of making decisions have been under development within the Department and within other agencies responsible for natural resource management.

The gradual introduction of some new policy measures in recent years was not driven entirely by existing legislation - rather their development was in response to a changing economic, social, institutional and environmental climate, which had its roots in changes in South Africa as well as global changes. The Water Act of 1956 was no longer an adequate tool with which to face the future. In many respects, new water policy and legislation are a reflection of medium-term changes in our overall environment, and the need to adapt resource management to address these changes.

Over the years, it had become clear that the 1956 Water Act, with its emphasis on development of water resources and its entrenchment of riparian rights, was no longer able to meet the needs of the changing political, social, economic and ecological environments. Water resource managers, faced with the challenges of limited water resources, the need for economic development and provision of basic water supplies, required policy instruments which were more flexible, more integrative and more dynamic.

The far-reaching political and social changes in South Africa in the early and mid-1990's only added to the tension caused by the gap between the outdated policy tools and the new realities of resource management. As well, during the late 1980's and early 1990's, data began to become available from South Africa's national monitoring networks which clearly demonstrated the long term trend towards degradation of the quality and ecological health of many of our most important water resources. Yet another source of pressure for change was the global trend towards recognition and incorporation of environmental concerns and values into resource management.

The National Environmental Management Act (NEMA) is equally a product of changing times and changing needs, and provides an overarching framework for sustainable management of natural resources in South Africa, with the intention, as with the NWA, of ensuring that this generation can benefit from wise use of resources, without prejudice to future generations.

WATER RESOURCE MANAGEMENT IN THE FUTURE

Sustainable management of natural resources requires achieving a balance between economic, ecological and social needs, whether at the project level or the policy level. As well as demanding a mix of technical and social or "softer" skills, achieving this balance demands expert judgement on the part of decision makers. Expert judgement is usually considered a legally valid way of making bright-line decisions where insufficient numerical data exists. Yet insufficient data will always exist because of the statistical uncertainty inherent in biophysical processes (which include human impacts), and because of some of the non-quantifiable social and cultural values placed on natural resources. So expert judgement will always underpin decision making, whether at local, national or international level. The problem is that judgement can seldom be fast-tracked - it has to be built up through adequate periods of field observation, training and experience. Much national and international research funding these days is going into the development of ever more complex and sophisticated models and decision support systems, but in general our graduate students and younger professionals in early or mid-career are no longer spending the time in the field which allows them to begin building the foundation of judgement that they need: collecting basic data, observing and investigating biophysical, economic and social processes in action.

Another challenge will be to balance the issues of resource (water) use and resource (ecosystem) protection (Rogers et al in press). Traditionally these two roles have been performed by engineers and scientists respectively and in South Africa we have no history of ecosystem protection. Controlling the storage and distribution of water for use is a very different task from keeping ecosystems in a state in which they can continually supply the services we need. The "balance of nature" is a myth and ecosystems are always on a trajectory of change towards some difficult to predict future state. This is equally true for water resources, since water resources themselves are ecosystems, from which we derive the benefits and services that water provides. Continual change and adaptation to achieve a somewhat uncertain future will be the order of the day for water resources managers.¹

The business of water resource management is an ongoing, cyclical process, which must allow for adaptive management, flexibility to changing issues and situations and constant

¹ Rogers et al, in press

learning.² The National Water Act provides for an integrated, adaptive process of water resource management. The various provisions of the core chapter of the Act are more or less arranged according to a logical process, which is shown schematically in Figure 1.

The business process shown in Figure 1 can be divided into several core activities, such as:

- Working with stakeholders to define a vision for a water resource;
- Setting the objectives for resource protection (determination of the class, Reserve and RQO);
- Scenario testing and planning a strategy for achieving the objectives;
- Operational management and control of water use and impacts on water resources (source directed measures such as licensing, authorisations and assessments);
- Auditing and monitoring;
- Reflection and review of objectives and strategies on a regular basis.

However, each of these core activities requires a team-based approach, utilising expertise from several different disciplines, although the balance and level of expertise may vary depending on the task at hand. For example, working with stakeholders requires the skills and expertise of social scientists and community facilitators, backed up by technical people (engineers, hydrologists, ecologists, economists) who can provide the necessary information as the stakeholders require it.

Under the 1956 Water Act, daily working procedures were very clearly defined and relatively unchanging. Under new legislation, all role players will need to develop understanding of the larger, more complex water resource management business processes and the role of their specific discipline or input in these more complex processes, as well as the interfaces between their work and the work of others in the business process. Role players include not only the people who are currently responsible for water resource management, but also those who are or will be training the water resource managers of the future.

LARGER CYCLES WITHIN THE WATER SECTOR

The business of water resource management, as it is carried out by managers in government or in water management institutions, must be seen in the larger societal context. The whole water sector, including researchers, technologists, managers, politicians and stakeholders, contributes to a larger cycle. Each contribution is different, but no less important, particularly in a participatory democracy (towards which South Africa is hopefully moving), and especially in adaptive, sustainable management of natural resources.

Figure 2 sets out a larger cycle which seems to be evident within a sector (such as the water sector) generally. The business process outlined in Figure 1 fits within one step of this larger cycle, which tends to operate over time scales of 20 to 40 years. The purpose of including Figure 2 is to indicate that the NWA has implications for people working in all parts of this larger process in the water sector, and to underscore the importance of learning together through partnerships and good communication between various role players over long periods of time. The message here is that we can only learn over a period of time as the impacts of our actions work themselves out in tangible results, and that changes at the scale of national policy and legislation should not be rushed if they are to be in the best interests of the country and the resources.

² DWAF (1999). Resource Directed Measures for Protection of Water Resources. Volume 2: Integrated Manual

The process shown in Figure 2 has been described with specific reference to the interfaces between ecological science, policy and resource management, but similar cycles can be seen if we consider the interfaces between the social sciences, policy and resource management, or the engineering sciences, or the economic sciences.

LESSONS LEARNED FROM RECENT POLICY DEVELOPMENT

Though it is still early in the process of development and implementation of the new water policy and legislation, there is a need for reflection at this time, to see where we have come from and what we have learned till now that might make the path ahead clearer, and indicate to us the kind of people who will be needed to take the new legislation to full implementation over the long term future. Note that these points are an entirely subjective view from the authors at this time, and do not necessarily represent the view of the Department !

▪ The value of strong vision and leadership

Initiating such a far-reaching change in the very basics of the way in which we see and manage water requires strong vision and leadership. The value of this cannot be understated, but often we see emphasis placed on the need for vision and leadership at a higher political level. While there is no doubt that political leadership and will are absolutely essential, what is sometimes overlooked is the need for sustained strong vision and leadership, *over a long period*, within the implementing agency or organization. This kind of leadership can not be provided by an external agency which is providing funds or policy support – it must be internally based within the implementing organization, though it can be supported, assisted and nurtured by external partners. Without this sustained leadership, the organizational change needed to fully implement policy will not be felt throughout all levels of the organization; things on the ground are likely to go on much as they always have done, simply because people have a natural inertia when it comes to changing the way in which they carry out their daily tasks.

▪ True integration is neither easy nor cheap

At a technical level, true integration between disciplines requires ongoing energy and commitment. Integration between water quantity and water quality aspects, between the various specialist ecological disciplines, takes considerable effort and time. It requires team work and team thinking (though not “groupthink”). At a specialist level this can really only happen face to face. Getting people together face to face costs money and time and takes strong project management skills, but is essential if we are to move towards truly integrated water resource management.

Many of the barriers to integration are organizational and can hopefully be overcome through organizational change, but some are set in tertiary education programmes, long before people enter the organization. Only very recently have we seen some South African universities responding to the challenge of producing truly integrative thinkers in the water sciences, and this change will take time to become evident in the cadre of professional water resource managers.

▪ Use rapid prototyping and learn-by-doing

New policy requires new tools, and new ways of operating systems, be they administrative systems, information systems, or water resource systems. If we wait for the ultimate, most elegant, most precise tool, we will wait too long. The rapid prototyping approach has worked very well for us in South Africa, at least in the development of procedures for determination of the Reserve and resource quality objectives. As we apply the prototype tools, we will hopefully learn more about what works and what doesn't, how systems respond to our management actions and how we need to refine our tools. This is, however, an approach which is sometimes uncomfortable for those researchers who are used to spending considerable time in design of tools and technologies, in order to ensure that these tools are fully developed before being released into the public domain.

▪ **Mobilize capacity through “virtual” teams & partnerships**

The Department does not maintain a large core of specialist expertise, and is unlikely ever to do so, since this is not really cost-effective for a government agency, especially in a developing country. There will be a need to build innovative partnerships within the water sector in order to support water management institutions, and innovative funding arrangements may be needed to achieve this. As an example, in the last three years, the very small group within the Department tasked with development of tools for aquatic ecosystem protection has generated and become part of a much larger “virtual” partnership involving key specialists from several organizations in the country (the RDM team).³

▪ **A free flow of information reduces resistance to change**

In any process of change at a scale like this, there is resistance, both from the stakeholders who are being affected in the way they use and make use of water, and in the implementing organization which has to make substantial changes to its business procedures and philosophies.

A constant free flow of information at all stages definitely reduces the resistance to change, whether the resistance is due to people feeling that their interests are threatened, or whether just due to natural human inertia in the face of change. Even if policy and tools are in early stages of development, spreading information about the concepts and principles helps people adjust along the way, and ensures later uptake of the technologies or tools in everyday resource management.

▪ **Face up to deep-seated issues of organizational change**

The crucial importance of issues of organizational change has been well documented in recent management literature, but is often not apparent to people from a more technical background. Yet no matter how good the technical tools are, if the organization is not able to take them up and implement them, the development is wasted.

Evaluating the tension between old form and new function, knowing the right moment to initiate structural changes or new institutional arrangements, require judgement and courage, and rest in the realm of great leadership. Here is the link back to the first learning point, that strong sustained vision and internal leadership is essential, not only to initiate change, but to have the courage to lead continuing change and do what has to be done to take policy to full implementation. It is doubtful whether interventions from external supporting agencies can adequately address this at a national level, though interventions can be very successful at a more local or project level. The building and utilization of virtual partnerships shows some

³ MacKay HM (2000). Moving towards sustainability: the ecological Reserve and its role in implementation of South Africa's water policy. Proceedings of World Bank Water Week Conference, April 2000.

potential, and the ongoing development of the role of a group such as the RDM team may provide some pointers for the future.

Like many other developing countries, South Africa is short on strong leaders with the necessary vision and expertise, particularly within government agencies and resource management agencies. Probably this is the greatest challenge of all facing implementation of our new water policy, and the one where the outcome is least assured.

CONCLUSIONS: BUILDING CAPACITY IN THE WATER SECTOR

“Phased and progressive” implementation of the new legislation is envisaged to take place over a period of 15 to 20 years. However, there must be an implementation schedule in place, with short, medium and long term goals. Likewise, we need to develop goals and strategies for short, medium and long term capacity building to support implementation.

In the long term, full time graduate programmes are needed which train people to begin taking up their roles and responsibilities in adaptive, sustainable natural resource management. We must recognize that, even with sound basic graduate training, it takes time to gain the more complex skills required in management today, and time to build up judgement – there are no quick fixes in those respects.

In the medium to short term, however, there is an urgent need to support people who are already involved in the water resource management, and who will be responsible for implementing new policy and legislation, through carefully planned interventions that include:

- in-service professional training courses;
- virtual organizations and partnerships to provide technical support and information;
- mentoring networks within which experienced practitioners can support less experienced water resource managers until they have built up their expertise and judgement sufficiently.

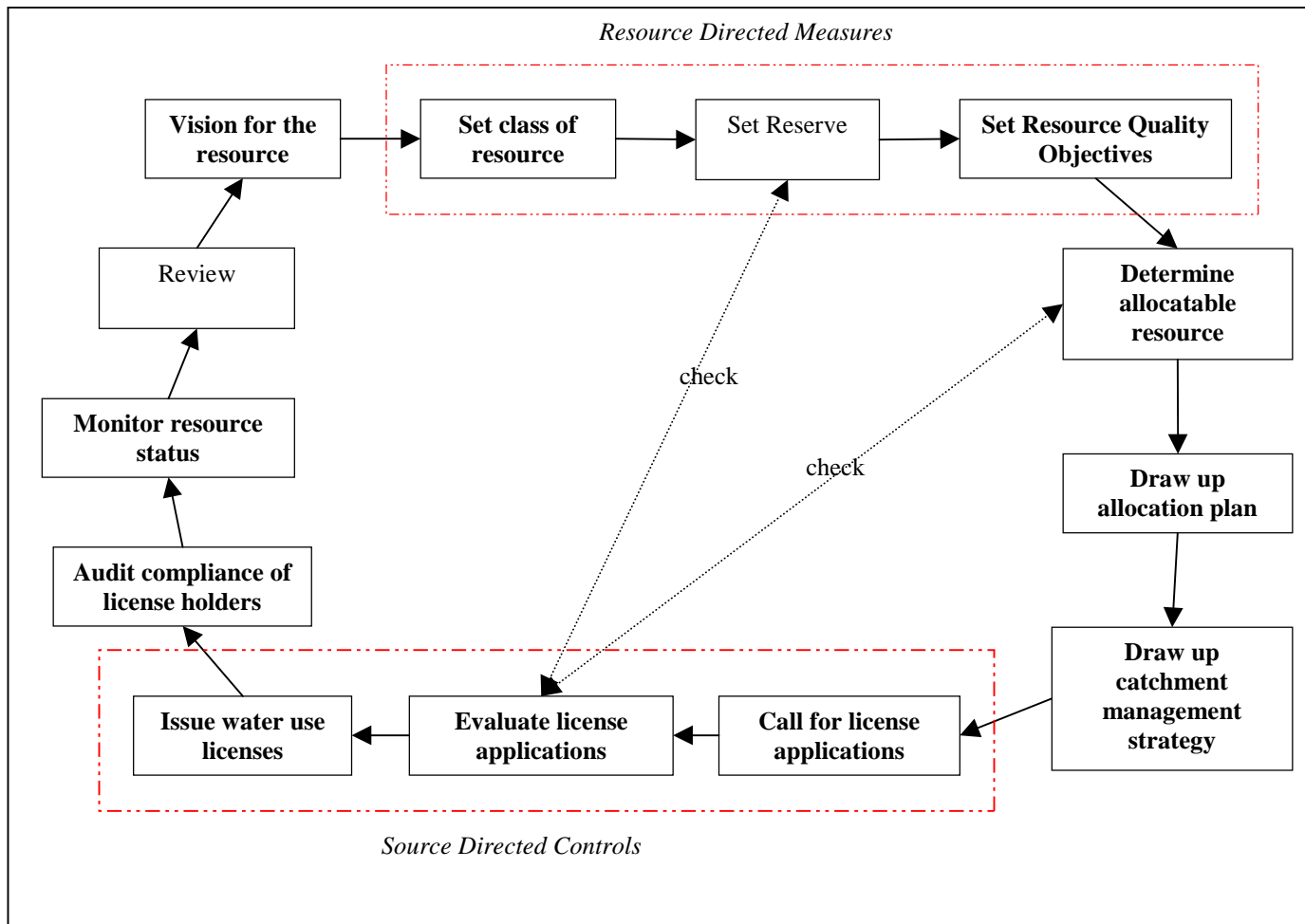


Figure 1: Water resource management business process

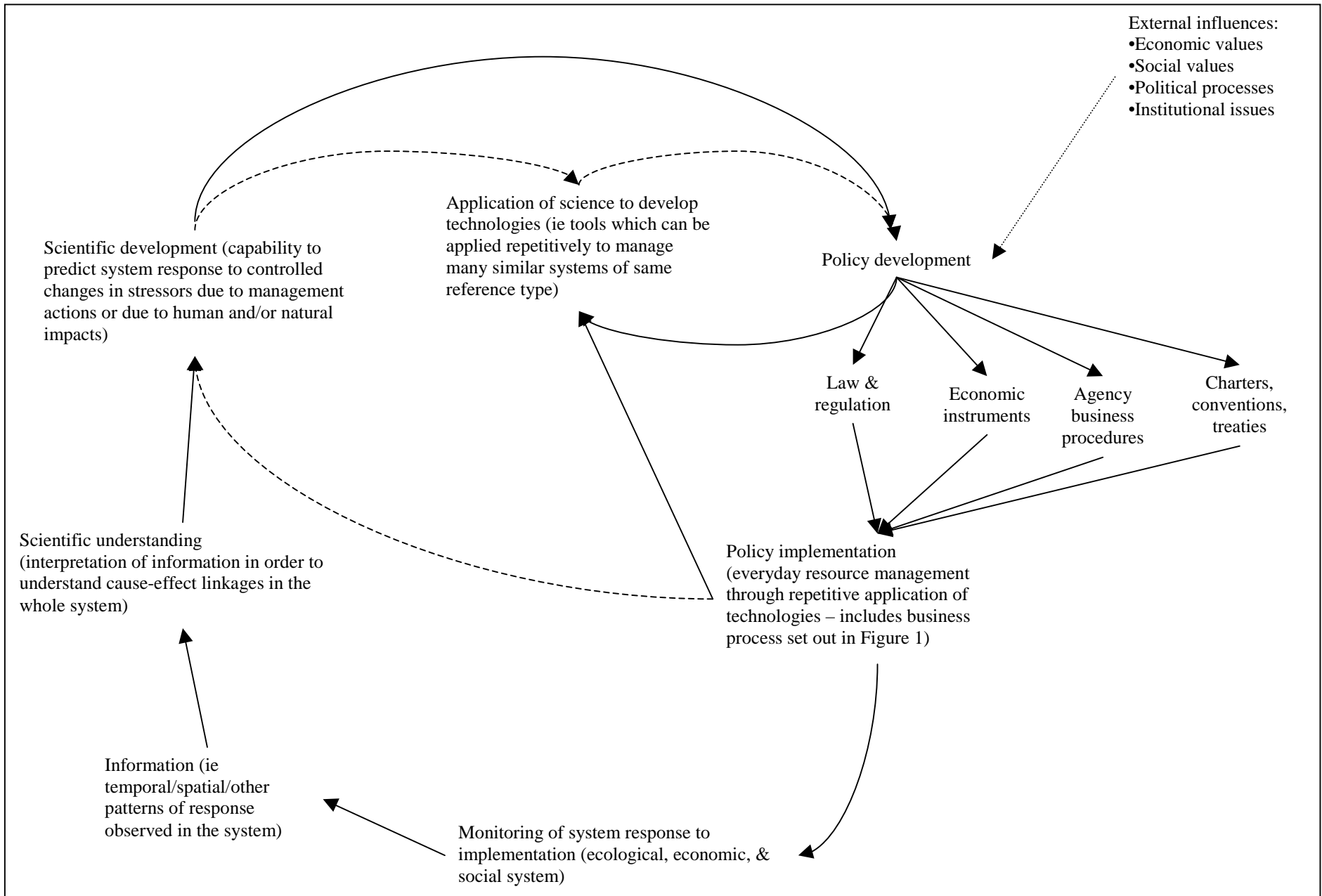


Figure 2: The science-policy-management cycle