

## EXECUTIVE SUMMARY

This project had its origins in growing appreciation of the need for research on river systems to contribute more immediately and directly to improved management of river systems. Research is perceived to be a service that leverages change in the way in which river systems (the resource) are managed. Research should improve our capacity to act in ways that direct behaviour towards sustainable use. This requires us to simultaneously address four issues: **perceptions** of the **state of the resource**, the **behaviour** that determines state, and the **regulatory environment**. Research should present 'seamless' interpretations as this accords better with how society experiences the real world.

If we are to improve leverage of change then research design, implementation and communication should address 'outcomes' (not only outputs) more explicitly than has been the case. An high level interorganisational entity, a 'Centre of Competence' is suggested as a way of enhancing our 'fitness to respond' through improved direction of research endeavor and, where appropriate, actively leveraging change.

Language currently applied in research and management is not supportive of leveraging change. This is because society, by and large, perceives rivers as a resource providing goods and services and through the use of which individuals experience benefits and costs, whilst scientists commonly refer to ecological state. It is suggested that the river system can be regarded as a production system. The Environmental Reserve is the allocation of water to sustain the river production system so that society can, in perpetuity, draw on the goods and services it produces. If water abstracted for use in production is equated with water left in the river for production, there would be less cause for confusion and misrepresentation for the Reserve.

The shift in emphasis for conversing about ecosystems and their state, to conversing about goods and services (not all of which need be monetised) and their state, draws attention to rights of use. Clearly for sustainable use there needs to be clarity over rights of use and the authority regimes that attend such rights. Whilst the matter of rights for use of water is clear, that for the goods and services produced by rivers is less clear. This is particularly so in sectors of rivers in traditional rural areas where, at least in the past, common property regimes prevailed. Two strategic research needs emerge: we need to understand how to design and implement public-private compacts that promote sustainable use of river systems. One suggestion is that these might take the form of 'Covenants of Mutual Obligation'. The second suggestion is that we need to understand how to use the issues of rights of access to goods and services, distribution of costs and benefits and the Covenants of Mutual Obligation to deepen understanding and practice of democracy. It emerges that we need to be able to enhance cohesion, improve demarcation, establish legitimacy and increase the resilience of communities so that they can express themselves effectively and appropriately in managing the use of river systems. Such a process of founding democracy around the use of river systems would promote efforts to achieve dynamic equity in resource use.

A state of dynamic equity is perceived as essential across all scales from local to regional. This is particularly relevant in South Africa because it shares so many river basins with other countries. It is clear that we do not yet have in place a system that enables us to interpret the propagation of impacts and their consequences across scales. We need to be

able to establish scenarios depicting how options at various physical and social scales are likely to be expressed in terms of river health and human welfare.

The key strategic research issues that have emerged from the study are:

- Establishment of an interorganisational entity (Centre of Competence in River Research and Management) that maintains our fitness to respond to issues pertinent to river system management.
- Strengthen our ability to leverage change consequent upon research fundings by shifting emphasis of research to outcomes and by connecting researchers and managers effectively.
- Strengthening of democracy in support of dynamic equity in apportioning costs and benefits deriving from the use of river systems and the adjoining land.
- Effective public-private compacts that empower civil society to promote sustainable use of river resources.
- A system for analysing and assessing the propagation of impacts and their consequences across scales whereby scenarios can be generated for decision-making.

### **Recommendations**

1. Establish a national 'Centre of Competence' for river management that acts as a broker of knowledge and experience. This Centre should bring together strategic thinkers and managers at senior level to ensure we have the required 'fitness to respond' to the challenges of river management.
2. Revise research organisations and management so as to strengthen collaboration between researchers, government and stakeholders, emphasising attainment of outcomes by leveraging change.
3. Initiate a comprehensive research and development programme directed at strengthening democracy in decision making around use of river resources.
4. Initiate a comprehensive research and development programme directed at establishing public – private compacts that empower civil society to continuously promote sustainable use of river resources.
5. Develop and institutionalise strategic analysis and decision making for river systems that enable integration across physical, social and economic scales.