

Executive summary

The objective of this consultancy was to explore progress in and barriers to the internalization of complexity in integrated water resources management, and to do this through a scoping synthesis of early lessons. In essence then the report seeks to provide a guide to complexity for Integrated Water Resources Management and research endeavours based on the issues identified from interviews with key stakeholders. In these interviews with academics and practitioners, a number of issues were raised regarding the internalisation of complexity and we hope that these have been addressed.

This guide was thus tailored to try to meet these different needs. The report comprises two sections: Section A which details complexity theory and thinking or in Section B which offers a number of case studies that have embraced complexity or that demonstrates properties emergent from complex systems. Section A starts with a history of the genesis and development of complexity theory, which arose as a critique to traditional science and management approaches, which are briefly reviewed. This is followed by an overview of the key principles of complexity theory and characteristics of complex systems as opposed to complicated systems. We examine the uptake of complexity theory and the associated and emergent theories, frameworks and practices. This is followed by a short discussion on 'tools' for complexity research and development although we caution against any strong focus on tools per se. In Section B we provide a number of cases that are illustrative of complexity, the first, which traces the adoption of strategic adaptive management by the Kruger National Park, was a process that explicitly recognised complexity. The second and third case studies of water resources management in two catchments, discuss self-organisation and feedbacks, both emergent properties of complex systems.

Acknowledgements

The authors would like to thank the Water Research Commission for the financial support of this project.

We also thank those who gave of their time for interviews and especially staff of SANParks. All of the attendees of the Akili workshop held in George in November 2009 are also thanked for their constructive inputs.