

# Developing scenarios for the water sector institutional landscape to develop effective responses to water quality challenges in a semi-arid region

M CLAASSEN<sup>1</sup>, C CHIKOZHO<sup>1</sup>, N FUNKE<sup>1</sup>, C ILBURY<sup>2</sup>, E KARAR<sup>3</sup>, E MASEKOAMENG<sup>1</sup>, S NIENABER<sup>1</sup>

<sup>1</sup>CSIR, PO Box 395, Pretoria, 0001, South Africa <sup>2</sup>Mind of a Fox, <sup>3</sup>WRC

E-mail: mclaasse@csir.co.za

## INTRODUCTION

Knowledge about key drivers and uncertainties of the future can provide information for making better decisions in the present. A deeper understanding of key drivers and trajectories of changes will not only clarify the impact of decisions, but will allow active countering of undesirable trajectories of change. The identification and characterisation of key uncertainties will also facilitate a more structured approach to risk management. Strategies and decisions can be played out in different futures to secure the most beneficial outcome through the most robust approaches while incurring the least risk. Scenarios which describe plausible futures will benefit resource managers and decision makers and empower all the role players in the water sector to engage in informed participative governance. This extends from politicians and policy makers through to government officials, the private sector and civil society, and from the urban middle class to poor rural communities.

### **RESULTS**

Inputs to the scenarios are sourced through a structured participative research process. The beneficiaries acquire the knowledge both through participating in the process and by accessing appropriate forms of communication. In this case, the process is as important as the products. The identification, description and ranking of key drivers and uncertainties are translated to potential implications, both for social and economic development and for the management of water resources and water services. The selection and development of indicators serve as navigation instruments to assess trajectories of change and support adaptive management towards desirable outcomes.

Multiple approaches have been used to identify key drivers. These include:

- The South African Social Attitudes Survey which included about 8000 household surveys to identify issues that society consider drivers for the future
- Individual interviews with leading experts in the water sector
- Debate and role-playing with high school children to solicit inputs from the younger generation on drivers and to provide inputs to scenario stories
- Web-based and email questionnaires to get views on identified drivers and suggest new ones
- National and regional workshops with 10-20 participants to get inputs and build awareness of, and capacity in, scenarios
- Strategic conversations with experienced individuals in the water sector, to consolidate drivers and develop scenarios.

The following drivers were identified through the first five methods above: 10.Skills . Privatisation 2. Global change 11.Staff turnover 3. Political stability 12. Technology development 13. Funding for operations 4. Decentralisation 14.Inter-sectoral dependencies 23.Land restitution 5. Rights to water

6. Equitable participation 15.Regulation

7. Biophysical constraints 16. Water use licensing 8. Civil society 17. Economics of water

9. Social and economic growth 18.Balance development and protection

19. Strategic planning 20.Local government 21.Ownership 22. Regional development

24. Disease 25. Water quality

26. Prioritisation 27. Globalisation The strategic conversation included the following issues:

- . Context understanding how the water sector, both globally and in South Africa, has changed. Trends defining the future of water were also explored.
- 2. Players an understanding was explored of the key players in this sector. This is critical to understand, as the future of the sector will be influenced and defined by the interactions, relationships and decision making of these key players.
- 3. Rules of the game (certainties) the certainties for the next 15 years were considered, as they will play out under all scenarios, and will in part define the 'game' in which the water sector moves in future.
- 4. Key uncertainties the key uncertainties that could influence or impact the institutional landscape were considered and then grouped and prioritised.
- Scenarios the two pivotal uncertainties were developed through a process of clustering and redefining the uncertainties. These two uncertainties form the axes in order to develop the scenarios.

The strategic conversation led to two axes being distilled for scenarios. These were "Complexity" and "Sustainability", as indicated in Figure 1.

### DECISION-MAKING PARADIGM DEALS WITH COMPLEXITY

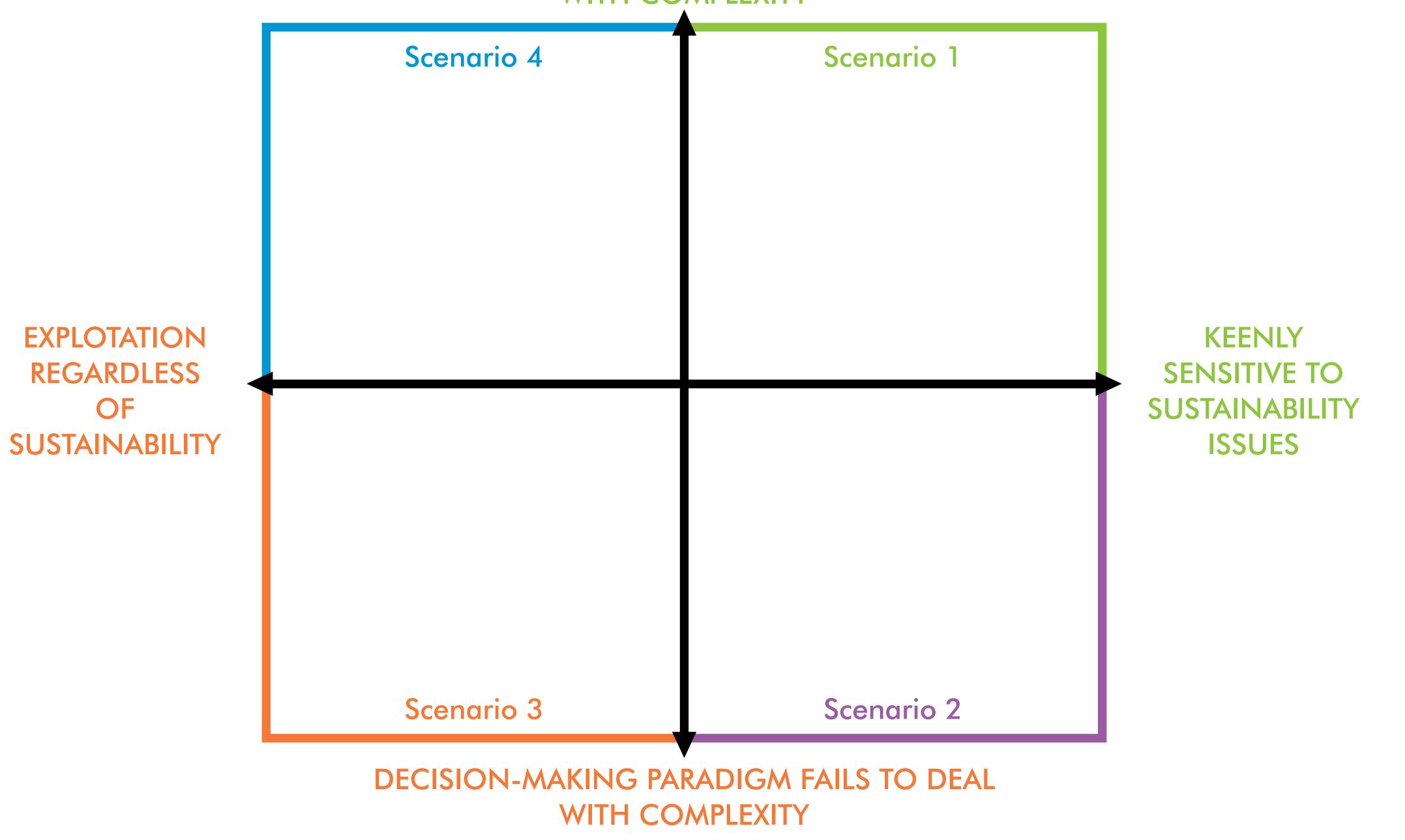


Figure 1: The water sector scenario game board

#### DISCUSSION AND POLICY IMPLICATIONS

South Africa faces particular challenges in balancing the pressing need for social and economic development, while also protecting water resources to secure viable options for future generations. These challenges are also expressed in the area of water quality, where the impacts of developments on the quality of water resources have direct implications for delivering water of acceptable quality for household, urban, industrial, mining, agricultural and recreational purposes. The scenarios approach leads to a better understanding of key drivers and uncertainties in the water sector. This promotes the effective deployment of environmental goods and services towards social and economic development, while allowing for the comprehensive management of environmental risks and ensuring environmental sustainability. The development and use of scenarios, in an appropriate manner, empowers society to participate more effectively in water governance.

#### REFERENCES

- Banuls VA and Salmeron JL (2007) A Scenario-Based Assessment Model-SBAM. Technological Forecasting & Social Change. 74 pp 750-762
- 2. DACST (1999) South African National Research and Technology Foresight Project. Pretoria
- Daum J (2001) How Scenario Planning Can Significantly Reduce Strategic Risks and Boost Value in the Innovation Chain. The New Economy Analyst Report - 8 September
- Glenn JC and Gordon TJ (2004) Current Validity of the Delphi Method in Social Sciences. Technological Forecasting & Social Change. 71 pp 405-416
- Galer G (2004) Scenarios of Change in South Africa. The Round Table 93:375 pp 369-383
- 6. GRA (2006) Science and Technology-based Water Scenarios for sub-Saharan Africa. www.research-alliance.net
- 7. Kahane A (1996) Learning from Mont Fleur: Scenario Thinking: Concepts and Approaches. Emeryville, CA: Global Business
- 8. Landeta J (2006) Current Validity of the Delphi Method in Social Sciences. Technological Forecasting and Social Change, 73 pp 467-482
- . Mietzner D & Reger G (2004) EU-US Seminar: New Technology Foresight, Forecasting & Assessment Methods, Seville 13-14 May 2004
- 10. Shell (2003) Exploring the Future. Scenarios: An Explorers Guide. Shell International Limited. London. pp 98
- 11. WBCSD (2006) Business in the World of Water: WBCSD Water Scenarios to 2025. ISBN 2-940240-93-0









