Water Scenarios

The Water Sector Institutional Landscape 2025

Claassen, M., Funke, N. & Nienaber, S.

WATER RESEARCH COMMISSION

WRC Report No. TT 514/11

The Water Sector 2025 – Institutional Landscape

Marius Claassen, Nikki Funke & Shanna Nienaber

Report to the Water Research Commission
by
CSIR Natural Resources and the Environment

WRC Report No. TT 514/11

December 2011

Editors
Claassen, M., Funke, N., Nienaber, S.

Contributors
Ashton, P.J., Bhagwan, J., Bofilatos, E., Busari, O., Chikozho, C., de Cock, E., de Groen, M., Dent, M., Dlamini, Z., Evans, J., Fourie, N., Goldin, J., Heinzen, B., Ilbury, C., Karar, E., Kempster, P., Lesufi, N., Masekoameng, E., Matimolane, M., Matlala, M., Mbizvo, C., Mhlanga, N., Mjoli, N., Mogase, M., Murray, K., Mutamba, J., Naidoo, D., Pegram, G., Pillay, D., Reinders, F., Rundberg, G., Schreiner, B., Schroder, R., September, C., Snyman, H., Swanepoel, J., Swiegers, C., Van Wyk, F

Schools participating
Phatfwa High, Rindzeni High School, Skukuza Primary, Lowveld High, Pretoria High School for Girls

Design & layout
Moondance Design and Photography

Cartoons
Jonathan Davis

Obtainable from

Water Research Commission
Private Bag X03
Gezina, 0031

orders@wrc.org.za

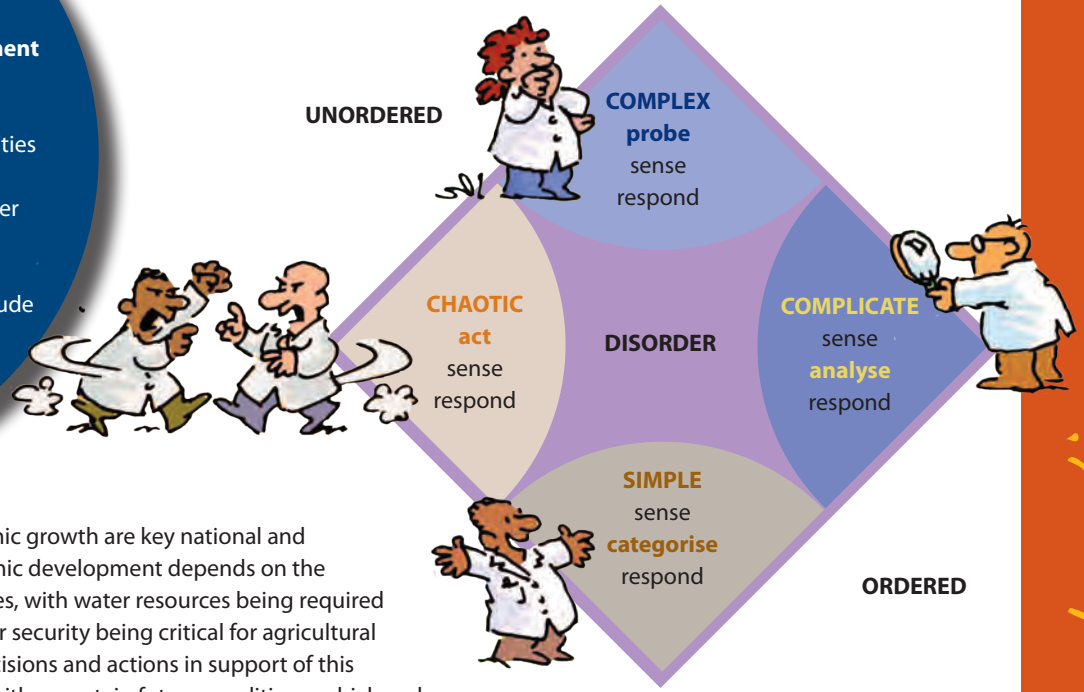
The publication of this report emanates from a WRC project titled The Water Sector Institutional Landscape 2025 (WRC Project No. K5/1841).

ISBN 978-1-4312-0202-7

Set No. 978-1-4312-0203-4
Printed in the Republic of South Africa

Process for Scenario Development

The context, players, rules of the game (certainties), key uncertainties and scenario outline (or game board), which constitute the water sector institutional landscape by 2025, were populated through individual interviews, social attitude surveys, WEB-based surveys, meetings and conferences.



Social development and economic growth are key national and regional priorities. Socio-economic development depends on the effective deployment of resources, with water resources being required for basic human needs and water security being critical for agricultural and industrial development. Decisions and actions in support of this development are often framed with uncertain future conditions, which make it difficult to predict the efficacy of a particular option in the medium and long term. These options relate to the way the water sector is organised (institutional architecture) and the specific decisions for water resource deployment. Scenarios provide perspectives on these future conditions by identifying important and uncertain drivers of change and describing plausible but diverse future conditions. Scenarios provide practitioners, stakeholders and policy-makers with valuable insights to guide effective decision-making in an uncertain world and provide indicators to counter undesirable trajectories of change.

Drivers of Change

The important and uncertain drivers of change were clustered around decision-making and sustainability.

The decision-making paradigm specifically relates to the ability to effectively deal with complexity. A complex system is inherently unpredictable, whereas something (like a clock) is complicated but predictable. The behaviour of a complex system emerges in a bottom-up manner as the system 'self-organises'. It is this unpredictability and self-organisation that have fundamental implications for decision-making. Snowden and Boone (2007)[1] characterise the decision-making approach in this context as engaging the system (probe), gathering information on how the system responds (sense) and then taking action (respond).

Sustainability is characterised by keen sensitivity to sustainability issues versus exploitation regardless of sustainability. Sustainable development is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs (UN, 1987)[2].

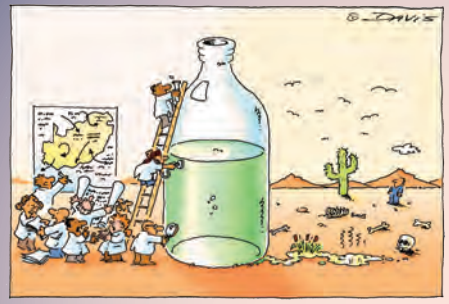
Important and uncertain drivers of change that were considered in the construction of the two high-level drivers included Strategic planning, Prioritisation, Inter-sectoral dependencies, Economics of water, Privatisation, Regulation, Water use licensing, Skills, Staff turnover, Funding for operations, Globalisation, Civil society participation and Ownership.

1 Snowden DF and Boone ME (2007) A Leaders Framework for Decision Making. Harvard Business Review, November 2007:69-76.

2 UN (1987) World Commission on Environment and Development: Our Common Future. Annex to General Assembly document A/42/427. "Brundtland Report"

Exploitation regardless of sustainability

Decision-making paradigm deals with complexity



Decision-making paradigm fails to deal with complexity

Keenly sensitive to sustainability Issues

Water Grid Scenarios

The Water Sector Institutional Landscape 2025

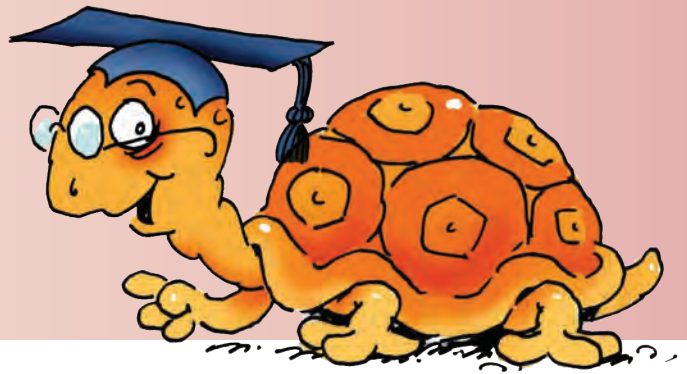
1

Wise tortoise

The scenario at a glance

The tortoise is a very resilient creature as it manages to thrive in the harsh conditions of the Karoo and can even live to 100 years. While the tortoise moves very slowly, it is good at protecting itself from danger by withdrawing into its hard protective shell. The tortoise is also seen as being very wise. An example of this wisdom is the famous tale of the Tortoise and the Hare where the Tortoise outsmarts the much faster Hare and ends up winning the race.

- Water is a strategic resource
- A clear national water resources strategy
- Right to access domestic water is universal
- Planning processes are integrated
- Systems and complexity thinking are embedded
- A paradigm shift has occurred
- Harmonisation of legislation
- State of institutional maturity and stability
- Dependent on sustainable economic growth and redistribution
- Water security a strategic focus area
- All stakeholders are empowered
- Proactive, not crisis, management
- Shared, principle-based vision
- Informal governance allowed to work
- Emergence of strong citizens' voices
- Accountability by all stakeholders
- Successful implementation of improved technology
- Attractive conditions for research
- Knowledge is shared across associated disciplines
- Solutions address complexity and sustainability
- Ministerial institutional instruments in place



1 scenario

The Water Sector Institutional Landscape 2025

scenario 1 – Wise tortoise

"A paradigm shift has occurred. There is no isolated and singular 'Water Sector'. Instead, it is a multi-layered and diversified composite of different sectors all actively engaged in respecting and ensuring the focus of water being a resource of strategic importance. As a result the supervision of this resource enjoys the benefits of proactive engagement rather than a discordant stream of ongoing crisis management.

This has been achieved through the increased harmonisation of other, associated, legislation and their implementation with water policy and legislation. Governance is not siloed into separate rule-based priorities. Instead it is guided by a shared, principle-based vision. This means a reduced transaction cost, and more tools are used other than just command and control.

There is now a state of institutional maturity and stability, one that recognises legal plurality and alignment with a confidence to embrace flexibility; it is, in essence, an enabling environment that allows informal governance to work. Moreover it harnesses indigenous knowledge, values and decision-making processes. Strong decentralised systems allow for local regulation and for local impacts to be addressed.

As people become more empowered to make choices and decisions based on their consumption of water, a strong citizens' voice starts to emerge. As such citizens embrace their integral buy-in into the responsible management of this resource. Combined with successful incentives, this has encouraged accountability by all stakeholders, from individuals through corporations and up to Government.

One of the main characteristics of this scenario is the successful implementation of improved technology and the requisite establishing of environments to develop expertise and a knowledge resource base. Changes in narrow social and political ideals have untethered restrictions on research, making it attractive for experts across all disciplines in the field of water management. More importantly these experts are encouraged to share their knowledge; and the resultant technological solutions are designed to address the issues of complexity and sustainability. These solutions are linked to conjunctive use, re-use and recycling as well as to empowerment.

Another defining feature of this scenario surrounds the ministerial institutional instruments that are in place. The relevant ministries jointly develop a national water resources strategy; the mandate is clear, and there is role clarity. There is inclusive implementation of the National Water Act, Water Services Act and other water related legislation. Moreover, adequate funding, regulation, monitoring and support are in place.

A tortoise will prosper when it has a complete understanding of its environment, and allocates the correct resources timeously, with great thought, and with conviction. In this scenario, a common understanding and awareness by all stakeholders has led to the appreciation of the true value of water to self and to others. It is recognised as both a social and an economic resource, but more importantly a finite one, which should therefore be protected and carefully managed. The environment flourishes, providing a sustainable resource of clean and re-usable water. The outcome of this scenario is a happy and prosperous people."

2

– Busy Bee

The scenario at a glance

The bee is synonymous with being industrious and works together with its swarm to maintain the bee hive, support the queen bee and produce honey. The bee is not good at coping with complex situations, however. When it perceives itself to be in danger, it will sting its enemy and will die as a result.

- Noble intentions but failure to correctly execute requisite actions
- Genuine zeal from Government
- Little economic growth
- Low social development
- Citizens don't see themselves as stakeholders
- No complete picture of the water system
- A distorted perception of the state of affairs
- Impression is out of touch with reality
- Projects embarked with good intentions, but not aligned
- Solutions are simplistic
- Poor spatial planning
- Increasing inability to deal with the unknown
- Research is poorly directed with no clear focus

Scenario 2 – Busy Bee

"This scenario is characterised by noble intentions but a failure to correctly execute requisite actions. Part of the reason for this is a distorted perception of the state of affairs.

The country has enough water – or so it seems – and there is a genuine zeal on the part of the Government to ensure that it remains so, and that the supply, and management, of water is sustainable. The right words are used: suggestions are enthusiastically embraced and there is clear evidence that sustainability is considered a priority. In fact there is almost an obsession towards developing and displaying a sensitivity towards sustainability at all costs.

Unfortunately, the picture is not so rosy. Although water resources seem well managed, the impression is out of touch with the dictates of reality. There is little economic growth and social development is slow. The demand for water is growing quickly and so problems are hiding just around the corner.

The Government is seen as solely responsible for the distribution and management of water, and as such, the country's citizens, although they are aware of the importance of water, don't see themselves as being part of the system and therefore partly responsible in ensuring its sustainability. In brief, they see themselves as consumers and not stakeholders.

This is part of a bigger problem: a failure to recognise the complexity of water as a resource and of its management. This has major implications, the chief being that solutions to the developing problems are multi-faceted, requiring ongoing input from many different stakeholders, robust discussions across all spheres, passionate research and innovation, and considerate but decisive decision-making.

As a result there is little consultation with other stakeholders, including citizens. Any discussion is meaningful but lacks depth. There is therefore no complete picture of the water system and where the other stakeholders within business, society and the environment fit in. Projects are embarked upon and implemented with good intentions, but they are often not aligned or integrated with other sectors. They often miss the mark, and are manifested in simplistic solutions, poor spatial planning and unsustainable infrastructure systems.

Without any systems thinking in place in management, the levels of dealing with the inherent complexity are low and the consequences of actions are not clearly understood. There is an increasing inability to deal with the unknown, and people within the management system operate in silos with little co-operation or sharing of knowledge.

Similarly, any research that is encouraged is poorly directed, without any clear focus. The passion is there, but it is dispersed and diluted in effect. The resultant knowledge is not internalised, no time is left to reflect on decisions, and there is little in the way of innovation, i.e. no new ideas to address pressing problems.

The sustainable management of water as a critical resource requires a clear, focused head and a complete picture of the complexity of the system. Priorities need to be put in place, focus ensured, and discipline and guidance needed to stay on course. It also demands some brave and tough decisions and nobility of purpose. But such nobility alone, even supported by a nose-down, shoulder-to-the-wheel commitment to work will not succeed. All it will ensure is a steady toil in a direction away from the complexity of the job – the path of choice of the bee."

3 – Ignorant Ostrich

The scenario at a glance

- » Incapacity to prioritise water as central to development
- » Water comes out of a tap and is something everyone wants
- » A poor understanding of sustainability

- » Impression of 'just do it'
- » Little, if any, systems thinking
- » Key phrase: 'short-term'
- » No clear institutional system in place
- » Rush to implement short-term and imbalanced solutions
- » Little concern to security, maintenance, quality and longevity of supply
- » International players 'investing' for wrong reasons?
- » Big business is calling the shots
- » Increasing complexity and costs
- » Knowledge and expertise devalued
- » Poor institutional memory
- » Water supply is irregular, insufficient and degrading
- » Weak understanding of intergenerational equity

Explanation of name

The ostrich is known in many stories to hide away from its problems by sticking its head in the sand. This behaviour makes it impossible for the ostrich to confront danger or survive it, which makes its behaviour both self-destructive and completely unsustainable.

Explanation of name

'Killing the Goose' (that lays the golden egg) is an aphorism for wringing the neck of a valuable and, if correctly managed, reliable and renewable valuable resource, all for short-term gratification. It is a metaphor for a highly irrational and irresponsible mindset.

scenario 3 – Ignorant Ostrich

"The driving feature of this scenario is the Government's incapacity to prioritise water as central to development and the rush to implement short-term and imbalanced solutions to the ever-growing challenges of a developing nation.

In this scenario the forces entrusted with the management of water (the Government) have a poor understanding of the concept of sustainability. To them sustainability is an illusory ideal and not demanding of immediate meaningful debate. They have 'more important issues' on their plate. There is frustration around general delivery.

Around water, people want taps, and they want them quickly. Little concern is afforded to the security, maintenance, quality, and longevity of the supply. As a result the Government has been forced to make quick, and often rash, decisions surrounding water issues, hoping to secure quick results. The concept of sustainability is lost in the rush.

If there is any positive side to this, it is that the Government has created the impression it has adopted a 'just do it' mindset. Their argument is that it is better to be doing something rather than debating around an ideal and not doing anything. Whereas this is true; it is such only if the decisions taken have been correctly thought through – 'correctly' in this context meaning 'with a robust view on the future'.

Unfortunately this is not the case. There is little, if any, use of a systems thinking approach, in fact there is little attempt to even understand the complexity of the system; and so decisions are made without proper concern for their impact on the system as a whole. There are significant consequences to these decisions, which are found out only after the decisions have been implemented. Learning by doing can have unfortunate repercussions.

If there is a key phrase in this scenario it is 'short-term'. Political and social imperatives for job creation and social and economic growth take precedence, with a view on 'improving the quality of life'; and decisions are made designed to secure as much as possible as quickly as possible. Water is not seen as a critical resource for sustainable management, it is rather something that comes out of a tap and which everyone wants in their home, and quickly. Any innovations in water management are therefore focused on delivery and not sustainability. Big business, such as mining, which is such an imperative to economic growth, is calling the shots. The Government is unable to establish and enforce a clear institutional system,

as it has to continually satisfy the demands of big business. Any negotiations with respect to water supply are therefore power-based, with little or no input bargaining opportunities afforded to environmental agencies or to the poor. Position-based bargaining overtakes the interests of interest-based bargaining. If there are any interests in the bargaining process they could well be political.

With no clear institutional system in place, unclear roles and responsibilities in the water sector and a constantly shifting operating environment, the transaction costs between stakeholders are high. Work is fragmented with gaps forming in some areas and overlapping in others, and where there should be complimentary roles between Government and service providers there is confusion, and a stalling of provision.

There are other forces at play: international players such as China are offering generous buy-in in the form of 'investment', but demanding substantial benefits in return, such as the ownership of resources. Attractive as these offers may seem, they are unquestionably short-term, and could open the door to unscrupulous deals and the further eroding of any possible sustainable water management. In an attempt to accelerate delivery, work is going to the private sector (often via costly tender processes), which in turn increases complexity in the system and, subsequently leads to higher transaction costs.

Where little in the way of financial resources or attention seems to be allocated, is in the development of knowledge and expertise. In fact it is devalued, even considered 'expendable'; and there are limited career paths and development opportunities for some players. Research becomes secondary in importance to provision, and in a sector that should be bristling with bright young minds considering a myriad of exciting challenges in sustainable water management, there is only a smattering of capacity, experience and knowledge of existing systems and issues, leading to poor institutional memory.

As a result, funds are directed at infrastructural investment without due consideration and expertise contribution around operations and maintenance. Furthermore, a lack of integrated planning leads to insufficient linkages between water supply and treatment capacities. The result is insufficient and irregular supply, large-scale water loss, and a rapid degradation of water quality. The water bubbles, but not in a nice way. Bad decisions have had unfortunate consequences, and the vultures have come home to roost.

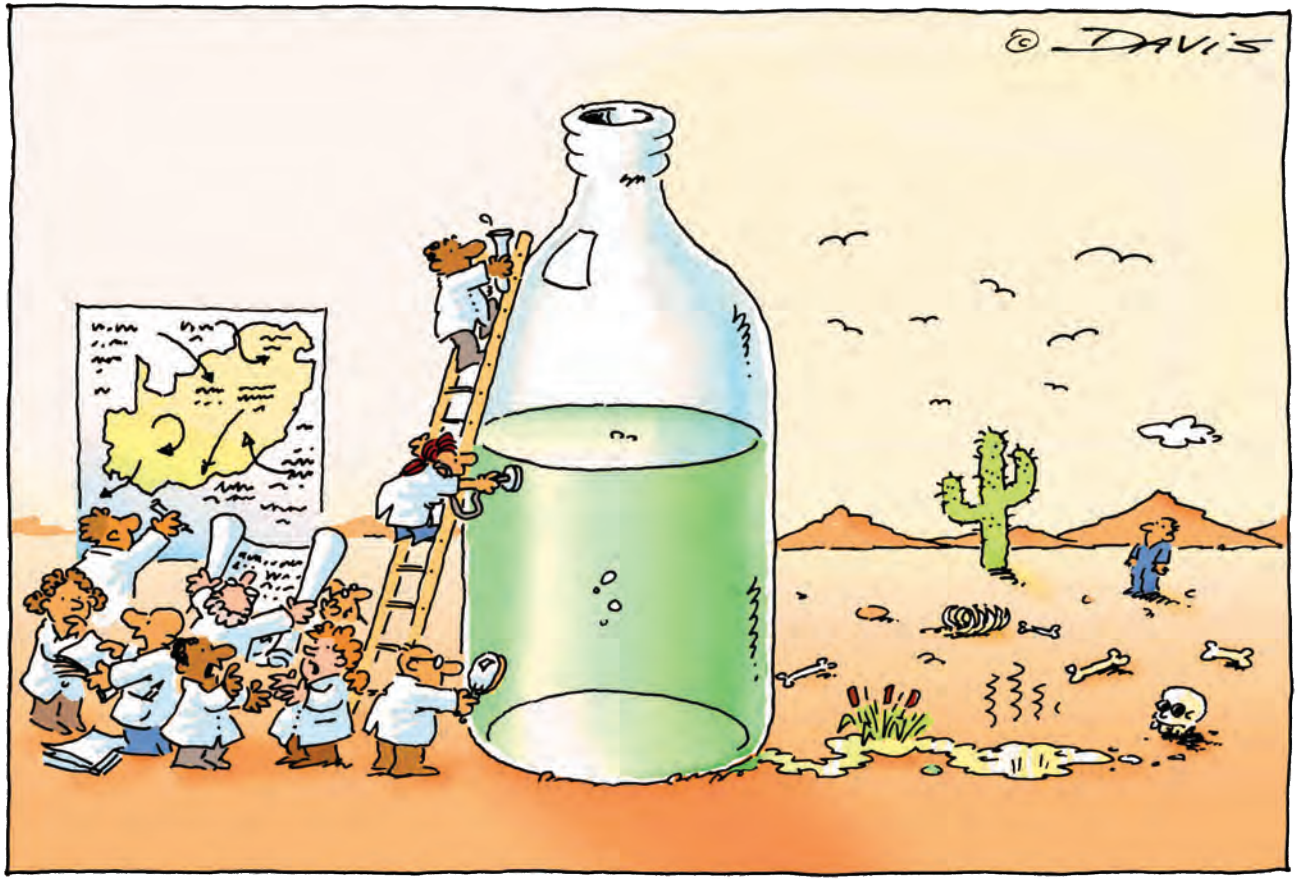
The combination of a weak understanding of intergenerational equity and a lack of common vision, combined with an unyielding quest for short-term benefit has placed a stranglehold around any considerations of sustainability for the water sector; and as what water is left in the system bleeds out, the ostrich that doesn't see the danger signs, takes its last breath."

4 – Greedy Jackal

The scenario at a glance

The jackal is seen as a sly creature in many stories that often makes clever plans to outwit other animals and benefit at their expense. These short-sighted and exploitative plans often backfire however, and so the jackal ends up worse than before.

- Water is scarce
- Water sector is 'stressed'
- Multidisciplinary approach is agreed upon
- Adaptive management becomes a forced reality
- Increasing discourse around trade-offs
- Increased conflict between competing users
- Outbreaks of water-borne diseases
- Citizens forced to rethink attitude towards water
- Country still developing and addressing backlogs
- Water bleeds away and wasteland is encroaching
- Shorter decision-making and response times
- New solutions need to be integrated
- Something has to give
- Innovation is key
- Water shortages and cuts
- Costs have skyrocketed
- Government blamed and suspends Water Act



scenario 4

The Water Sector Institutional Landscape 2025

The jackal is seen as a sly creature in many stories that often makes clever plans to outwit other animals and benefit at their expense. These short-sighted and exploitative plans often backfire however, and so the jackal ends up worse than before.

scenario 4 – Greedy Jackal

"In this scenario water is scarce. Resources are running dry in a country that is still in the process of development and addressing backlogs. As such the Government is chiefly concerned with pandering to the social and economic demands placed upon it, and, as a result, represses any pressures for environmental responsibility.

A term that quite correctly describes the water sector is 'stressed'. Water basins, water supply infrastructure, water sanitation processes and water management structures are all under stress. Demand is exceeding supply, and in the rush to allocate the depleting resources, scant regard is given to any long-term sustainability. Water bleeds away in the face of an encroaching future wasteland.

However, the prevailing mindset is anything but fatalistic. Something must be done, and a multidisciplinary approach is agreed upon. The problem is a complex one, as are any possible solutions, and through the combination of a team approach and a burgeoning understanding of the complexity, adaptive management has become a forced reality. Projection planning is abandoned in favour of scenario planning, which is characterised by shorter decision-making and response times. Learning is not through testing, but by doing. This is evident in increasing discourse around trade-offs, such as the sharing of resources, efficiencies and co-operations.

Ongoing research agrees on the severity of the problem, and there is acknowledgement within the Government of the complexity of the problem; as such new solutions have to be integrated and take into consideration the dimensions of economic, agricultural as well as social development. This is an ideal under unfavourable conditions, and is therefore not easy. Conflict increases between competing users, and the ideal has to be abandoned at times to satisfy specific interests, be they economic, social, agricultural or even political.

There is little agreement amongst stakeholders, and any decision-making is fragmented further by the vocal interference of lobby groups who seize the opportunity to pressurise malleable components of the decision-making process towards satisfying specific interests.

As a result, one of two things happens: either the system starts to work to favour an elite (economically powerful) few rather than the whole population, or a massive socially driven redistribution process is embarked upon, at the expense of any measurable economic gain or benefit to environmental sustainability. The harsh reality is that something has to give.

Are there any solutions? If so, their hand has been forced by the global economic slow down and the resultant limited financial resources. Established, long-term, large-scale solutions are put on hold. Immediacy and cost restraints make it clear: innovation is key. It's time to think out of the box.

There is another pressure: the stress and scarcity of water has a very visible face – the harrowing image of a sick and distressed populace. There are outbreaks of water-borne diseases amongst the poor; and in the more affluent suburbs continual water shortages and forced cuts to supply have sewn anger and frustration. Where water is in supply, costs have skyrocketed.

South African citizens are confronted with tough decisions and are forced to rethink their former cavalier attitude towards water. This is indeed a bitter way to learn about the limited nature of this critical resource.

In frustration they turn to the Government, whom they see as the ultimate authority in the management of water. The Government in turn centralises control and, in frustration and unable to implement preferred measures, suspends the Water Act."

Navigation

Different actors in the water sector need to understand their present position on the scenario game board and use the signposts shown in the diagram to navigate towards a desired future.

Who can use these scenarios?

These scenarios can be used for strategy development, planning and management in the water sector, as well as sectors that are strongly related to the water sector. The application of the scenarios can be at different scales and with different foci depending on the priorities of the different groups or individuals.

Government actors can benefit from the scenarios by applying them to strategic planning and management within departments. The interpretation of the scenarios in the context of issues that are relevant to each entity can be co-ordinated by facilitators with experience in scenario building and application. Strategic sessions should ideally be held away from the office, which helps to distance people from their immediate pressures to think more creatively and strategically.

Researchers can also benefit from these scenarios, with peer network discussions, workshops, conferences and electronic media providing good opportunities to consider the implications of the scenarios for current and future research. Researchers should be aware of scenarios and indicators of which scenarios we are moving towards. Such awareness will direct research to issues that are important to avert undesirable future outcomes.

Civil society (non-governmental organisations, schools and communities) has "on the ground" experience of what is happening in terms of water availability and quality. A good understanding of the drivers, options and impacts of different water futures will empower these actors to participate effectively in water governance.

NOTES

WATER
RESEARCH
COMMISSION

www.waterscenarios2025.co.za

9781431202027