November 2012
The WRC operates in terms of the Water Research Act (Act 34 of 1971) and its mandate is to support water research and development as well as the building of a sustainable water research capacity in South Africa.

TECHNICAL BRIEF

# Rural water services

## A risk-based methodology to assess social vulnerability in the context of water infrastructure

## A WRC-funded study investigated disaster management at local government level to reduce risk.

### Mainstream disaster risk reduction

Intensive efforts to mainstream disaster risk reduction into development have been underway, internationally, since 2005. These efforts arose from the Hyogo Framework of Action (HFA) 2005-2015, a ten-year plan to substantially reduce losses following disaster and to improve upon coping capacity before, during and following hazard or disaster to which South Africa is a signatory.

### Focus at local management

The focus of this study was a meeting between water resource management (WRM) and disaster risk reduction (DRR) at the local level. The first aim of the study was to propose a straightforward methodology for understanding vulnerability and resilience to hazards that negatively impact the supply of potable water at the community level. The second aim was to identify opportunities to mainstream DRR into aspects of water services, thereby improving the sustainability of all water service provision and increasing the resilience of communities to water-related hazards.

### Case studies

The risk-based approach was applied to three case study areas, namely the rural town of Cala and selected surrounding villages in the Eastern Cape, the township of Kayamandi in the Western Cape and the mining town of Carletonville in the Wonderfonteinspruit catchment in Gauteng. Data collection and desktop research was conducted for each case study. Case study fieldwork was conducted in Cala and nearby Tsengiwe village, and Kayamandi.

*The village of Cala, in the Eastern Cape.*

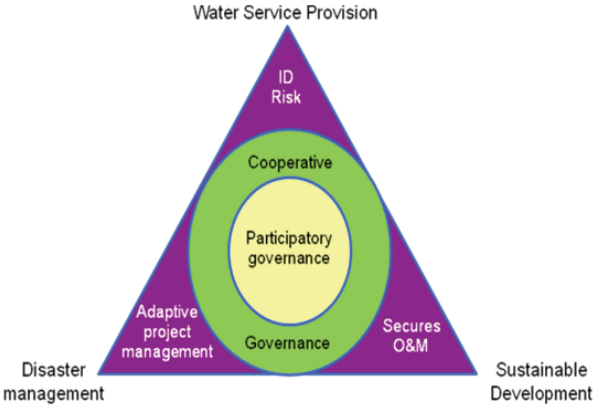
### Lack of proactive risk reduction

During the case study research and the development of the methodology for risk assessment at community level, problems were identified regarding the lack of proactive risk reduction approaches in relation to water infrastructure. The problems included:

- Lack of vision for long-term sustainability and relationship to Disaster Risk Reduction;
- Public participation is a case of ticking boxes;
- The funding system and cycle supports new infrastructure rather than the maintenance and operation of existing infrastructure; and
- General institutional failure and a lack of responsibility as long Key Performance Areas (KPA).

### Risk management of water services

Risk management of water services is underpinned by the frameworks of disaster risk management and sustainable




*Risk management of water services is underpinned by the frameworks of disaster risk management and sustainable development and ensured through cooperative and participatory governance.*

development and ensured through cooperative and participatory governance.

## Road map

An approach has been developed that provides the context and roadmap for Water Service Authorities (WSAs) to integrate the human element that contributes to increased risk into all aspects of water services delivery: from conception, planning, financing and implementation, monitoring and evaluation to operations and maintenance. It picks up on gaps in existing approaches and adds value by applying a "risk" as opposed to "service delivery".

## Conceptual framework

A multidisciplinary and collaborative way to mitigate risks and maximise opportunity in the water services sector, building on the HFA and the municipal processes for planning, implementing and funding infrastructure projects is proposed. It draws on the principles and practice of cooperative governance and community participation outlined in relevant legislation and the best practice of constructive dialogue and adaptive management established in the water sector.

The result is a conceptual framework for action for integrating risk management into water service delivery operations and maintenance, with an emphasis on the psycho-social-political dimensions.

## Implications

***Future studies:*** The risk assessment methodology should be disaggregated to groups within sub areas of a community, e.g. gender and age specific groups/data within formal and informal settlements within Kayamandi. These can be defined after initial data survey and field work. Thereafter indicator definition and selection to best reflect the complex realities on the ground (i.e. establish a conceptual model of this reality indicating variations in and between sub groups/genders) to establish whether further field work, data collection at village and or household level and scoring approach is decided upon. Regular application of monitoring and evaluation using the risk assessment methodology developed in this study is required.

***Application:*** The application of the risk management approach to the implementation of water infrastructure should be piloted in order to develop guidelines and facilitate mainstreaming.

***Training and guidelines for managers:*** A Tool Box to support the guidelines and training of WSA/WSP project managers in risk reduction approaches and participatory local government should be prepared.

***Community level education***: Guidelines and education material aimed at community level to educate and build awareness on water demand management, water and health related matters as well social vulnerability and what communities can do for themselves to improve coping capacity in relation to hazards related to water and its infrastructure should be developed. Such material needs also to be less generic and more relevant to the circumstances of the communities.

***Climate change:*** Mainstreaming of DRR into water infrastructure development, operations and maintenance in rural and informal areas within the context of climate change should be undertaken.

**Further reading:**
To obtain the report, *A Risk-Based Methodology to Assess Social Vulnerability in the Context of Water Infrastructure* (**Report No. 1888/1/12**) contact Publications at Tel: (012) 330-0340; Fax: (012) 331-2565; Email: orders@wrc.org.za or Visit: www.wrc.org.za to download a free copy.