August 2014
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.

POLICY BRIEF

Wastewater treatment

Improving the quality of wastewater treatment services

What are the financial implications for municipalities wanting to achieve a Green Drop rating? A WRC-funded study investigated.

Background

South Africa has more than 800 wastewater treatment facilities dotting the national landscape managed by 156 municipalities, treating around 5 258 Ml/day of sewage. Of these plants, more than 70% are micro, small and medium-sized works.

The Water for Growth and Development Report notes with concern that poor water quality is a threat to the growth of the South African economy and the health of the country's populace. Malfunctioning wastewater treatment works is a major cause of the deteriorating water quality in the country and it may be expected to threaten neighbouring countries in the river basins which South Africa shares with its neighbours.

In an effort to reverse the trend of deteriorating water quality, the then Department of Water Affairs introduced the Green Drop certification programme.

This programme aims to improve the performance of wastewater treatment works through providing an incentive to the works in the form of a scoring system which rates the aspects of wastewater treatment performance. Those wastewater treatment works which performed properly were awarded Green Drop status.

The first Green Drop assessment was conducted in 2009. In the latest Green Drop result to be published, in 2011, only 40 wastewater treatment works achieved Green Drop status.

Objectives

What would it take to improve the quality of service rendered by wastewater treatment works, and what is the risk of not doing so and how could this be mitigated? This study endeavoured to unpack these questions and to provide some suggestions as to what is required.

Findings

The 2009 and 2011 Green Drop ratings for a total of 416 wastewater treatment works were analysed. Among others, these results showed that where works managed to increase their scores between 2009 and 2011 there was a general improvement in management. The most important categories for improvement were Effluent Quality Compliance (i.e. what flows out of the works) and Operations (Process Control).

Given this knowledge, the study explored what it will cost to improve the performance of wastewater treatment works. The following factors were found to be most influential to works performance:

- Skills availability
- Effluent treatment levels in relation to plant capacity
- Investment in refurbishment and improvements
- The risk category of the plant.

The study then moved on to investigate 19 wastewater treatment plants in Gauteng. Again refurbishment and improvement was found to be necessary at some of the plants. This points to the need for future investment and hence the need to consider different pricing and financing mechanisms for achieving this investment.

While there is a range of conventional pricing and financing options available, they tend to be expensive options and difficult to access over the short term. This dilemma is aggravated by an urgent need to improve and upgrade many of the wastewater treatment works in South Africa.

A range of innovative pricing and financing mechanisms for assisting in dealing with the implications of the rapid growth in urbanisation and economic development has recently emerged. Applying such options would also assist in reducing the pollution discharges and assist in achieving the much required environmental outcomes, while being efficient and cost-effective.

It is, therefore, recommended that wastewater treatment works strongly consider implementing such in addition to their on-going engineering solutions linked to refurbishment, improvement and expansion. These options include the consideration of Payments for Ecosystem Services, and/or the introduction of a pollution discharge trading system.

With the consideration of these it would be possible to integrate both financial efficiency considerations as well as environmental objectives.

Risk of not improving wastewater treatment

There is a substantial risk linked to the non-improvement in the performance of wastewater treatment works. Not only is the current load on these works too much already and hence their underperformance, adding additional loads that could logically be expected due to increases in both income and people, will only add to the already overburdened ecosystems in which the effluent are being discharge.

While the upgrade and expansion of wastewater treatment works are imperative, the difficulties these works are being faced with is to source the required funds and skills to access such funds, and the time it takes to develop new financing mechanism, which requires that urgent action be taken to mitigate the risk.

Attention should therefore be given to the introduction of technologies such as floating islands, which could be used either on-site (i.e. on the works' oxidation or maturation ponds) or off-site (i.e. in the river system). The introduction of these technologies could coincide with implementing Payments for Ecosystem Services, such as for the reduction of nutrient loads using wetlands, and pollution discharge trading systems.

Conclusion

The current precarious state of wastewater treatment works in South Africa is a matter of grave concern. It has a detrimental impact not only the health of both people and ecosystems; it negatively affects the moral fibre of society leading to social unrests and even deaths.

This is a matter that requires urgent and immediate attention. This study identified the drivers for change and/or improvement, irrespective of the size of the plant, to be skills and the cost of improving wastewater treatment works through refurbishment and improvements. This implies the need to improve the skill base of the workforce and to invest in the refurbishment of the plants.

As conventional financing mechanisms tend to be expensive, the range of innovative and environmental benign funding options that have recently emerged should be explored. Failure to improve the quality of the country's wastewater treatment works will require the riparian systems to provide waste dilution services, increasingly so and in a compounded way.

This will place undue pressure on the already stressed systems. Decision-makers would therefore be well-advised to engage in mitigating such risk by investing in in-stream biotechnologies as a risk mitigating measure concurrent to investing in the refurbishment of wastewater treatment works.

Further reading:
To order the report, ***Wastewater treatment plants: The financing mechanisms associated with achieving Green Drop rating*** (**Report No. 2085/1/14**) contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za or Visit: www.wrc.org.za to download a free copy.