ALL FALL DOWN – Existing Assets Abandoned in Race to Meet Targets

The South African government has received international acclaim for its efforts to reduce the enormous water and sanitation backlog inherited after 1994. But all of these efforts will mean nothing in the long term if existing infrastructure is not properly operated and maintained.

It is well known that some municipalities do not prioritise operation and maintenance, especially of 'unglamorous' infrastructure such as sewage treatment works, but, until recently the extent of the problem was not very well known. Last year, the Department of Water Affairs & Forestry (DWAF) launched an investigation into the asset management situation in order to provide guidance to Water Services Agencies (WSAs). An initial study by CSIR into the status of water services infrastructure asset management among these authorities while, pointing out that there are municipalities (especially large metros) that do all they can to keep infrastructure working, the general picture is not a pretty one.

Research shows that insufficient attention is being paid by the majority of South Africa WSAs to the ongoing commitments that they have incurred to manage their infrastructure. In addition, many authorities have, due to years of neglect, built up a backlog of need in respect of maintenance and also refurbishment, renewal and replacement.

This has serious consequences for the health of communities served as well as the surrounding environment. An example of this is a self-assessment survey undertaken last year of local and metropolitan municipalities. Only 37% were compliant with drinking water quality regulations. A total of 61% perceived their water quality to be good; while 58% stated that they do regular monitoring and 49% stated that they comply to the national drinking water standards.

In addition to water treatment and reticulation services, WSAs are usually responsible for maintaining the waterborne sanitation piped network, and frequently also the pumping facilities. DWAF conducted a nationwide sanitation sustainability audit in 2004/2005 to ascertain the functionality of sanitation projects completed during 1994 to 2003. Most of these projects implemented basic sanitation facilities (e.g. VIP toilets).

The survey revealed that up to 28% of households sanitation facilities have failed or are in the process of failing; only 53% of municipalities have adequate operations and maintenance capacity; 78% of municipalities have no operations and maintenance plan for VIPs; and 66% of households indicated that they did not have a

sanitation health and hygiene education programme.

NON-COMPLIANT SYSTEMS

With regards to wastewater treatment works, especially those that have much mechanical plant, the most common immediate cause of effluent not meeting DWAF standards is, as it is with water treatment works, a breakdown of plant and/or length of time that it takes to have plant repaired, both of which are largely attributable to inadequate budgets or operator error or both.

A survey by CSIR of a number of sewage treatment facilities in Gauteng showed that many of these are producing effluent that is not meeting DWAF standards, in fact, some of the works are producing effluent that is little distinguishable from the raw sewage that flows into the works. A similar survey of Free State systems revealed that almost half of outgoing effluent is not compliant to bacteriological and chemical oxygen demand standards, requiring urgent intervention.

To make matters worse thousands of schemes, previously operated and maintained by national government, are now being handed over to WSAs. In 2003, 1 544 departmental schemes valued at R9,95-billion were surveyed as they were being prepared for transfer to local government. While the vast majority of the schemes were working, some rehabilitation was needed, 40% because of normal ageing, 19% due to vandalism, and 18% because normal maintenance had not been done.

A national audit has found that up to 28% of household sanitation systems (mostly basic sanitation) have failed or an in the process of failing.

CHASING THE TARGET

South Africa has set ambitious targets for itself in terms of providing access to safe water and sanitation to all. Unfortunately, this means that municipal priority is delivering new infrastructure rather than operating and maintaining existing infrastructure so as to ensure sustained services delivery.

A financial modelling exercise undertaken during 2005 on behalf of the Department of Provincial and Local Government and Development Bank of Southern Africa showed that new infrastructure rollout targets of the majority of municipalities will lead to these municipalities acquiring new infrastructure at such a pace of the next few

Routine maintenance of sewers is essential to reduce sewage spills.

STELLENBOSCH'S DIRTY SECRET

Stellenbosch, the second oldest town in South Africa, renowned for its world famous wineries and prestige university, has got a dirty little secret. The Plankenbrug River, tributary of the Eerste River, the town's main water resource, has become so polluted over the years that it is now little more than an open sewage ditch.

Dr Jo Barnes of the Department of Community Health, at the Faculty of Health Sciences at the University of Stellenbosch has studied the increasing faecal contamination of the river and its effects on the health of the surrounding community for nearly a decade. She raised her concerns at the EnviroWater conference held in Stellenbosch, in February.

In January, she raised the alarm when a rat-tailed maggot was identified in one of her water samples, taken regularly since 1998. These maggots, the larvae of the drone fly, are usually found only in poorly kept sludge and manure ponds. The presence of these maggots in the river, according to Dr Barnes, is a biological indication of the severe pollution of the river. If ingested the organism could cause diarrhoea.

On 23 January, water samples from the Plankenbrug River indicated 16 million faecal coliform organisms per 100 ml, of which 9,2 million organisms were *E. coli*. "Municipal officials have called me a tragedy queen, but this is a serious disaster happening right before our eyes," she told delegates.

Several bacteria and viruses have been found in the river, causing everything from skin rashes and eye irritations, to diarrhoea, kidney infection, scarlet fever, Hepatitis A, and pneumonia. More recently, it has been discovered that some of these disease-causing organisms found in the river are resistant to widely used antibiotics and to chlorine. Those organisms found to be resistant to chlorine were found to have a double resistance to antibiotics.

The Plankenbrug River runs past the dense settlement of Kayamandi, situated on the outskirts of Stellenbosch. With one toilet for an average ten families ill disposal of human waste is a serious problem. People either use the river directly as a toilet or faecal matter from buckets and other containers find its way into the river through the stormwater system.

While Kayamandi has largely been blamed for the pollution it is not the only culprit, said Dr Barnes. "The systemic failures of the wastewater treatment works and sewerage systems of many towns in the area also contribute to the high faecal coliform counts in the river. The river also passes through the Stellenbosch industrial area and, at times industrial effluent has been found in the river."

Investigation has found that allowing sewage to overflow into the river system when there is a problem at the sewage treatment works is not a new phenomenon and has, in fact, been practiced historically in municipalities. The challenge is changing this entrenched mindset and realising the danger to community health this causes.

It is the poor among the Stellenbosch community that bear the burden of this pollution. A study commissioned by the Department of Water Affairs & Forestry in 2001 showed that during one year, 1 000 people in Stellenbosch will experience 582 mild cases of diarrhoea, 52 moderate cases and 13 severe cases (these severe cases are mostly children under five years old). Almost all of these cases are people in Kayamandi living in informal housing. In 67% of the cases, the patients are female.

Of the total costs as a result of disease (hospital and treatment costs, lost working days etc), 7% is financed by local government, which is running the clinics. The provincial government running the hospital finances contributes 32%, while the community finances the remaining 61% either as lost income due to illness or due to expenses related to self treatment.

"Water pollution such as this arising from inadequate sanitation in dense settlements is escalating and causing serious water quality problems," noted Dr Barnes. With our serious water situation, we cannot afford to write off rivers like this."

years that they will be increasingly unable to afford the costs associated with the operations and maintenance of that infrastructure.

Never mind that many of them are unable to afford the operations and maintenance costs of the infrastructure they already have. Government's campaign to address imbalances would, ironically, seem to be contributing to widening the range.

An additional contributor to this is the acquisition of infrastructure at levels of services that are higher than 'basic' despite the limited ability of consumers to pay for the service, or for potential for cross-subsidisation within the municipality.

SHOW US THE MONEY

Financial issues often lie behind infrastructure operational and management problems. Firstly, a municipality might not have sufficient financial resources to allocate to infrastructure management, even if all councillors are fully supportive of infrastructure asset management. Secondly, there is often insufficient understanding by local authority politicians of the importance of maintenance.

This insufficient understanding is crucially manifested in the under-provision of maintenance budgets. This is sometimes exacerbated during

A serene picture, but spillages from overloaded waste-water treatment works are a serious threat to Cape Town's rivers.

Wealth with water

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Wilson Award
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the course of the year by reallocation of some of the maintenance budget to other purposes.

It has been found that local and district municipalities spend 60% more of their budgets on capital projects that the metros do and 11% less on operations. In other words, local and district municipalities budget more than the metros do for acquiring infrastructure than they budget on operating and maintaining it.

The loss of key technical staff .... is inhibiting infrastructure management and, in many cases, can be identified as the main reason for breakdown of service.

The budgets of rural-based municipalities are of particular concern. Typical impoverished municipalities, whereas basic levels of water services have been provided, subsequent lack of maintenance coupled with no control over the high levels of informal connections means that the majority of these schemes are no longer capable of providing a consistent daily basic water supply.

GONE IS THE CAPACITY

The loss of 'intellectual assets' is a very major threat to effective infrastructure management and hence to compliance. The loss of key technical staff, and their non-replacement by others less qualified, is inhibiting infrastructure management and, in many cases, can be identified as the main reason for breakdown of service. It is interesting to note, for example, that there is currently no enforceable regulation that the technical services manager of the WSA be a qualified engineer or engineering technologist.

A study published late last year by the South African Institution of Civil Engineering has shown that the number of and expertise of the municipal staff whose responsibility it is to operate and maintain municipal infrastructure has not kept up pace with the increase in the stock of infrastructure. Indeed, in many areas it has diminished even in absolute terms, never mind in proportion to the increase in the stock of infrastructure.

South Africa has an increasing proportion of deteriorating infrastructure together with poor and often unacceptable quality services, an investigation into the status of water services infrastructure has found.

For wastewater treatment works that have much mechanical plant, the most common immediate cause of effluent not meeting national standards is a breakdown of plant and/or length of time that it takes to have plant repaired satisfactorily and for it to resume working correctly.

Identifying the problem is always the first step in rectifying it. DWAF has now started a process of identifying the key factors that drive the existing state of water services infrastructure and the state of its management. Thereafter, a plan of action will be prepared for the water services sector. It is hoped that this plan will lead to much needed improvement in many of South Africa's municipalities.