

Maintenance, skills still impede infrastructure services



While South Africa's national infrastructure managed a 'satisfactory' C- in the latest assessment by the South African Institution of Civil Engineering (SAICE), the country's water and sanitation structures have been shown to be increasingly at risk. Report by Lani van Vuuren.

The SAICE Infrastructure Report Card for South Africa 2011 is the second released by the institution, the first being published five years ago. The report focuses on the present condition of engineering assets in ten different sectors, from water and sanitation to ports, rail, healthcare and schools. "This report has been three years and many hundreds of hours in the making," noted report convenor Sam Amod.

The assessment shows that, in general, there has been marginal improvement in the country's infrastructure, fuelled mainly by the heavy investment in national assets such as ports, rail, airports and national roads. However, this does not mean that there has been a blanket improvement, state the authors. "On the contrary, the quality and reliability of basic infrastructure serving the majority of our citizens is poor and, in many places, is getting worse. Urgent attention is required to stabilise and improve these."

WHERE HAVE ALL OUR ENGINEERS GONE?

The prevailing skills shortages in the engineering sector again emerged as a theme this year. South Africa remains grossly under-served by technical expertise – the ratio of population to engineer in the country is about 3 200 to 1 (20 times less than other upcoming countries such as China and India). Furthermore the vast majority of engineers remain older white males.

The challenge remains most acute in local government circles (a previous SAICE survey had found that out of 283 municipalities, 83 had not a single technical employee on staff). Those municipalities who did employ engineers and/or technicians reported large numbers of vacancies, often owing to budget constraints. Thus the inadequate capacity of these service providers to fulfil their responsibilities remain a recurring theme.

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“From evidence it is clear that much of local government is indeed in distress, and that this state of affairs has become deeply rooted within our system of governance. In assessing the reality of poor municipal performance, cognisance needs to be taken of the unresolved problems identified in previous assessments (despite recognition from national government and legislation that is often in line with best practice) and the intergovernmental impact of this failure, both institutionally and for communities.”

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Added to the lack of engineers is the lack of maintenance of existing infrastructure. To address remaining historical imbalances and keep up with the demands of socio-economic growth government is still focused on the rollout of new infrastructure rather than maintaining that which is already in existence. “Infrastructure, once created, is unrelenting in its demand for maintenance and this demand will increase the longer it is ignored.. South Africa is a developing country and government has recognised the importance of infrastructure in increasing equality and meeting social and economic needs, but this recognition is compromised by neglect of maintenance which results in infrastructural failure and recapitalisation requirements,” the document points out.

SAICE’s assessors, led by a team from CSIR, found a dearth of data pertaining to infrastructure. Reliable, consistent data is a prerequisite for the urgently required shift towards routine maintenance. Data permits planning, prioritisation of targets and adequate budgeting for maintenance and extension.

Overall, the allocation of maintenance funding was found to be wholly insufficient, especially in circumstances where it was expected to also cater for a maintenance regime that had led to neglect. This inadequacy is accordingly compounded by poor management, which results in the meagre funds going unspent.

WATER

Bulk water infrastructure was scored a **D-**, slightly down from the 2006 assessment. Of specific concern is the deteriorating state of the country’s bulk water infrastructure, much of which is reaching the end of its life and will soon require upgrade or replacement. The Department of Water Affairs (DWA) is responsible for 250 schemes with a replacement value of R139-billion. The average age of this infrastructure is 39 years.

SAICE has found insufficient maintenance and capital renewal, compounded by the serious capacity and funding problems within the department. According to the report it has been estimated that reinvestment of R1,4-billion a year is required to maintain present bulk water infrastructure. “The problem [of lack of maintenance] is compounded by fading institutional memory as individuals retire or are lost to the private sector. Still, despite long lead-in times for new projects and the above problems, DWA has been proactive in planning new supply schemes, which is a positive step.”

“However, since 2006 a disturbing mismatch between water demand and bulk infrastructure development has come to light, with the result that users in the highly strategic Vaal and Umgeni systems are exposed to unacceptable risk of water restrictions for the next decade,” the report points out. This mismatch, it says, was precipitated by comprehensive failure to meet water demand management targets. However, it also points to a failure on the part of authorities to react to this serious problem in time.

“The long delay in identifying large-scale water theft by farmers along the Liebenbergsvlei River and further delays caused by failure to monitor abstractions is also symptomatic of the severe shortage of capacity within the Department of Water Affairs.” Studies initiated around the Vaal River system as far back as 2004 discovered that up to 240 million m³ of irrigation water

Left (p 12): A typical metropolitan sewage treatment plant.

Right: Around R1,4-billion a year is required to maintain South Africa’s bulk water infrastructure.

Below: A worker prepares to clean a VIP toilet in the eThekweni municipal area. With few exceptions maintenance of infrastructure remains a challenge in South Africa.



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There remain big anomalies in the state of wastewater infrastructure between large metropolitan centres and rural areas.

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use in the Upper Vaal was unlawful, and that this was probably the main reason for the water management area's negative water balance.

The report points to a general culture of complacency which has developed in South Africa regarding water resources and use. The country needs to do much more in terms of instituting appropriate water conservation technology and a water conservation culture. Another serious problem is the uncontrolled, high levels of pollution, especially in dams.

With regards to municipal water supply, extreme variations in the condition and performance of infrastructure in the water sector were found. For example, water supply quality was found to be very good in metropolitan areas, but frequently unacceptable in rural areas. On the up side, 2,2 million South Africans have been provided with basic services. SAICE also praised DWA for introducing the Blue Drop/ Green Drop certification systems, which it described as 'a very positive development' and 'a key initiative in monitoring water quality locally'. "Releasing the reports to the public

have set a good example to the leaders of other infrastructure sectors," the authors said.

SANITATION

Major urban areas were scored an unchanged C- for sanitation infrastructure, with the report pointing to serious problems with the management of many wastewater treatment works. There is also a lack of wastewater monitoring (not meeting effluent standards or even measuring effluent quality) in many plants. However, the greatest challenges remain in rural areas, and sanitation infrastructure here scored a very unsatisfactory E grade.

While an additional 3,3 million people have gained access to basic sanitation facilities since the 2006 report card was published users are often not receiving the full benefit because of high failure rates. The report points to the fact that most sanitation facilities are not compliant with appropriate technical design standards resulting in them being built in a manner susceptible to quick failure and extreme maintenance difficulties. Secondly, there is

a consistent lack of communication with users on why and how to use these facilities, compounding maintenance problems.

"One example of these problems is the fact that many sanitation facilities lack hand-washing facilities and do not impress the importance of hand washing to users. This simple, avoidable problem threatens all hygienic improvements and restrictions of disease achieved through proper sanitation."

"From our evaluation, skill constraints notwithstanding, bold leadership and effective management are irreplaceable ingredients for successful and sustainable infrastructure provision," noted Amod. "More of this leadership must be directed to changing the behaviour of the public if our resources – and infrastructure – are to be sustainable."

While this report outlined government's infrastructure-related deficiencies, all South African citizens were responsible for sustainability, Amod concluded.

To access the *SAICE Infrastructure Report Card for South Africa 2011*, visit: <http://www.saice.org.za/pdf/IRC2011-landscape-1-final-lr.pdf> □