

INEQUALITY AND ECONOMIC MARGINALISATION



Access to services for poor people in urban areas

CSIR

For Urban LandMark

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ABOUT THIS RESEARCH

The 2007 Annual Report of the Accelerated Shared Growth Initiative of South Africa (AsgiSA) identified a need to focus on what was then called ‘the second economy’, and on mechanisms to ensure shared growth reaches the margins of the economy. The Second Economy Strategy Project was initiated in this context. It reported to the AsgiSA High Level Task Team in the Presidency, but was located outside government in TIPS.

A review of the performance of government programmes targeting the second economy was completed in early 2008. The project then commissioned research and engaged with practitioners and policymakers inside and outside government. A strategic framework and headline strategies arising from this process were approved by Cabinet in January 2009, and form part of the AsgiSA Annual Report tabled on 16 April 2009.

In South Africa, people with access to wealth experience the country as a developed modern economy, while the poorest still struggle to access even the most basic services. In this context of high inequality, the idea that South Africa has ‘two economies’ can seem intuitively correct, and has informed approaches that assume there is a structural disconnection between the two economies. The research and analysis conducted as part of the Second Economy Strategy Project highlighted instead the extent to which this high inequality is an outcome of common processes, with wealth and poverty in South Africa connected and interdependent in a range of complex ways. The different emphasis in this analysis leads to different strategic outcomes.

Instead of using the analytical prism of ‘two economies’, the strategy process placed the emphasis on the role of structural inequality in the South African economy, focused on three crucial legacies of history:

- The structure of the economy: its impacts on unemployment and local economic development, including competition issues, small enterprise, the informal sector, value chains and labour markets.
- Spatial inequality: the legacy of the 1913 Land Act, bantustans and apartheid cities, and the impacts of recent policies, looking at rural development, skewed agriculture patterns, and the scope for payment for environmental services to create rural employment.
- Inequality in the development of human capital: including education and health.

TIPS’s work around inequality and economic marginalisation is built on the outcomes of this strategy process.

The research undertaken under the auspices of the Second Economy Strategy Project continues to be relevant today as government explores policy options to reduce inequality and bring people out of the margins of the economy. This report forms part of that research.

A list of the research completed is available at the end of this report. Copies are available on the TIPS website: www.tips.org.za.

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TERMS OF REFERENCE

Extract from letter from Urban LandMark dated 2008-02-25, received 2008-03-20:

“Your task in relation to the project is to provide written and verbal input into the process of preparing the urban component of the second economy strategy. In this regard you are required to reflect on the area of urban services¹ and the implications for the urban poor, within the attached project outline, as well as against key framing reports and conceptual documents that will be made available to you. The task involves a secondary analysis of recent work in the field as well as a reflection on specific cases and data where this is available to substantiate a position and recommendations for providing urban services that enhance access for the poor. The particular tasks are:

- To provide an analytical reflection on the provision of urban services with the aim of enhancing the access of the poor to urban areas. (See note below) Such reflection should be based on empirical data and case information where possible, should be well argued and should include:
 - An exploration of the concept of ‘improving access to services’ from several points of view; infrastructure maintenance - both in terms of job creation and in terms of service provision; alternative institutional means of providing services; communal services points; interventions required to make existing technologies work better; alternative technologies; local communities taking involvement in service provisions; the potential that lies in housing and infrastructure upgrading and reflections on implications for procurement.
- To propose recommendations for urban investment/interventions on the basis of these findings.”

In subsequent correspondence, "the aim of enhancing the access of the poor to urban areas", in the first bullet point, was amended to "the aim of enhancing the access of the poor to SERVICES IN urban areas" (e-mail exchange with TZ 2008-03-25).

¹ Including water and sanitation, roads, storm water, solid waste, electricity, telecommunications and buildings (excluding transport).

SUMMARY

This report provides an analytical reflection on the provision of infrastructure services in urban areas, with the aim of enhancing the access of the poor in urban areas to these services. It commences by considering what is meant by “access” to services, pointing out that much more is involved than simply providing services in physical proximity to the intended users of those services.

The report summarises principles that must underlie the provision of infrastructure services in urban areas for all in society and in the economy, especially the urban poor. Infrastructure is only a means to an end. Specific characteristics of the community to be served are all-important in making decisions on infrastructure. Also, selection of infrastructure (specifically levels of service) and its planning and design is wittingly or (often) unwittingly made in the context of a set of planning, design, construction, operation, maintenance and upgrading assumptions. The validity of those assumptions needs to be investigated - and, if it is found that they are not valid, then those selection decisions need to be reviewed.

Understanding of this is essential in:

- Addressing the end (enhancing the access of the poor to services in urban areas) by the most appropriate means (which may not be an engineering service, but could be by education, or an institutional means);
- Integrating the service with other means to the same end; and
- Selecting levels of service and standards.

The bulk of this report is devoted to a discussion of the three ways that “the poor” in urban areas and “urban services” interface. These three ways are as follows:

The poor get services. Their quality of life is thereby raised. In addition, the availability of these services opens up possibilities for earning income.

The poor getting services directly raises their quality of life. But the services could also (dependent on the peoples’ initiative and other factors as well) enable them to generate income in the short term (in the sense that they can do work, and get paid for it, because they now have water or electricity) and in the future (because they now have electricity to study and so on, and can improve their ability to get jobs, or to get better jobs).

Issues of the quality and reliability of services, and ways in which the poor can or cannot cope if services are of poor quality and/or are unreliable, are best discussed under this heading.

The poor get income. This better enables them to get services.

The poor can obtain more services if their income rises or if the cost of services falls. Incomes rising relative to the cost of services gives households greater ability to purchase what they need -- which could include more or better quality services.

Issues of the cost of services are discussed under this heading.

The poor get income from playing a part in the service provision chain.

The poor earn income through building, operating or maintaining the infrastructure, or through selling the service.

Each of these three types of interface needs its own approach, drivers, incentives,

facilitators, etc. Nonetheless, they cross-cut: each in some or all other ways affects the other. For example a particular change in technology might be able to both improve reliability (and therefore improve income generation potential) and reduce cost.

The report concludes with a comment about quick wins (in individual situations there is much scope for these, but there are no broad-based (i.e. with national impact) quick wins to be had), and recommendations.

DEFINITIONS

“Delivery” embraces not just the placing in service of infrastructure, but the appropriate operation, including maintenance, of that infrastructure for the whole of its designed life.

“Maintenance” is in the current report used as a generic term to include repair of infrastructure, refurbishment and renewal, and provision for replacement of that infrastructure.

The following definitions are direct quotations from the Water Services Act (Act 108 of 1997).

“Water services” means water supply services and sanitation services.

"Water services authority" means any municipality, including a district or rural council as defined in the Local Government Transition Act (Act 209 of 1993), responsible for ensuring access to water services.

WHAT IS MEANT BY 'ACCESS' AND BY 'IMPROVING ACCESS TO SERVICES'?

"Access" and "improving access to services" cover several dimensions. The attempt is made in this report to outline these dimensions, and to discuss their implications.

To illustrate: there could be the potential for ready physical "access" to a service point -- that is, the service point is nearby, and can be reached conveniently - and the service delivery is reliable. However to obtain "access" a cost might be involved, which a household cannot afford to pay, and as a consequence this household will not enjoy "access". Conversely, finance might not be a problem, and the service point is physically convenient, but "access" is denied because the service provider has failed to deliver -- or is temporarily failing to deliver (case in point -- recent power outages) -- or is delivering, but the quality isn't good enough for practical purposes (case in point -- contaminated drinking water).

Access to services can thus be improved in many different ways, including: ²

- Making access physically easier;
- Making physical access safer;
- making access less expensive;
- Doing a trade off between price to the household and convenience;
- Doing a trade off between price to the household and the equity³ it must contribute;
- If incomes rise then ability to afford services rises; and so on.

These different dimensions of access must be borne in mind in reading this report, especially when the point is raised that providing "access" to a community requires more than simply the laying of, say, a pipeline and a tap.

WAYS IN WHICH THE POOR AND URBAN SERVICES INTERFACE

It is convenient, for the purposes of discussion, to distinguish three ways that "the poor" in urban areas and "urban services" interface.

The three ways are as follows:

The poor get services. Their quality of life is thereby raised. In addition, the availability of these services opens up possibilities for earning income.

That is, the poor getting services directly raises their quality of life. But the services could also (dependent on the peoples' initiative and other factors as well) enable them to generate income in the short term (in the sense that, because they now have water or electricity, they can do work and/or produce goods and services they couldn't do before, and they can get paid for these) and in the future (because they now have electricity to study and so on, and can improve their ability to get jobs, or to get better jobs).

² These improvements could be effected by the household (e.g. the trade-offs), or by the service authority (e.g. making physical access safer). Or they could be independent of both household and service authority (e.g. incomes rising).

³ For example as in "sweat equity".

Issues of the quality and reliability of services, and ways in which the poor can or cannot cope if services are of poor quality and/or are unreliable, are best discussed under this heading.

The poor get income. This better enables them to get services.

That is, the poor can obtain more services if their income rises or if the cost of services falls. Incomes rising relative to the cost of services gives households greater ability to purchase what they need -- which could include more or better quality services.

Issues of the cost of services are best discussed under this heading.

The poor get income from playing a part in the service provision chain.

That is, the poor earn income through building, operating or maintaining the infrastructure, or through selling the service.

Each of these three types of interface needs its own approach, drivers, incentives, facilitators, etc. Nonetheless, each in some or all other ways affects the other -- for example a particular change in technology might be able to both improve reliability (and therefore improve income generation potential) and reduce cost.

Each of the three is discussed in this report, but after the next section.

PRINCIPLES OF THE PROVISION OF PUBLIC INFRASTRUCTURE

A number of principles must be considered, that must underlie the provision of infrastructure services in urban areas for all in society and in the economy, including the urban poor. They lie at the heart of the integration of infrastructure services provision with land use planning and settlement formation, and at the heart of infrastructure being enabled to fulfil its purpose of underpinning the urban economy and quality of life.

Infrastructure is only a means to an end. The "end" can be variously defined but it certainly includes, for the households living in a settlement, greater health and safety and greater access to income-earning opportunities and communities. Understanding this is essential in:

- Addressing the end by the most appropriate means (which may not be an engineering service, but could be by education, or an institutional means);
- Integrating the service with other means to the same end; and
- Selecting levels of service and standards.

Community-specific characteristics are all-important. For example, an assumption that certain health-and safety-related ends will be achieved if certain levels of infrastructure services are provided, and that, if complimentary services are also provided, this will constitute a sufficient holistic package of health and safety, might only be true for more affluent South Africans.

The assumptions are, however, probably not true for the less affluent. In a total public sector budget for health and safety services, for example, too much emphasis on only one aspect (say, water and sanitation) could -- for the less affluent -- reduce the resources available for other services. There is an evident need for a holistic view of the range of urban services (including [infrastructure]) before decisions are made on basic need levels, and before investments are made.

For a simple example: if a poor household is suffering "bad health", is their priority necessarily waterborne sanitation? Is it not possible that a more appropriate intervention by the public sector could be dietary supplement, improved shelter, assistance with growing vegetables -- or a job for the head of the household? Yet there are many like instances where waterborne sanitation has been provided ahead of these other interventions.

Finally, it must be noted that selection of utilities (i.e. infrastructure) and their levels of service, and the planning and design of the selected utilities, are, wittingly or (often) unwittingly, made in the context of a set of planning, design, construction, operation, maintenance and upgrading assumptions. These assumptions relate to the following questions:

- How will the utility, its level of service, and the chosen technology suit conditions expected in practice? Examples of these conditions are:
 - geotechnical and groundwater conditions;
 - type of housing and its density; and
 - frequency of use of the utility (for example: how many persons per utility, and how much of each day are they using the utility?).
- How will the utility be constructed (i.e. workmanship)?
- How will the utility be operated and maintained?
 - by the individual users; or
 - by the corporate agency (community, NGO, private company, local government)?
- Other elements upon which the success of alternatives is dependent (principally, assumptions as to institutional capacity, enforcement of regulation, monitoring of use, adequacy of funding for operation and maintenance, and so on).
- What complementary services are required? For example, if a collective water service is provided, will sanitation also be provided, or at least a means of dealing with sullage, and vice versa?

The validity of those assumptions needs to be investigated - and, if it is found that they are not valid, then those selection decisions need to be reviewed.

As noted at the beginning of this section, the section is a summary of principles of the provision of public infrastructure that must underlie important decisions on the provision of infrastructure services in urban areas for all in society and in the economy, including the urban poor.

Indeed, given the vulnerability of the urban poor, particularly in respect of their dependence on the public sector for the provision of many services, including infrastructure services, and their lack of options should the public sector not meet their needs, the principles must be considered ESPECIALLY when planning for the urban poor.

This is not an issue just for planners, or for engineers -- or indeed only for the built environment professionals. The point is that infrastructure services can enable realisation of planners' best intentions for "performance qualities or "convenience" in respect of

optimising the living environment for the urban poor -- or it can frustrate these intentions. Putting it another way, and using an example, services can be designed so as to support and reinforce objectives such as "integration" and "densification", optimising their benefits, while mitigating their disadvantages --or services can be installed without any sympathy for these objectives.

Infrastructure can even be proactive -- for example coming up with new technologies, or ways of making infrastructure more affordable.

The poor get services. Their quality of life is thereby raised. In addition, the availability of these services opens up possibilities for earning income

That is, the poor having access to services directly raises their quality of life. But the services could also (dependent on the peoples' initiative and other factors as well) enable them to generate income in the short term (in the sense that, because they now have water or electricity, they can do work and/or produce goods and services that they couldn't do before, and they can get paid for these) and in the future (because they now have electricity to study and so on, and can improve their ability to get jobs, or to get better jobs). Issues of the quality and reliability of services, and ways in which the poor can or cannot cope if services are of poor quality and/or are unreliable, are best discussed under this heading.

While the DBSA found "a marked coincidence between increases in infrastructure stock on the one hand and economic growth on the other", it was not able finesse the same techniques to finding correlation between infrastructure and the economic well-being of the poor. (DBSA 1998 page 35). Nonetheless, DBSA states with confidence that: "Infrastructure services can contribute to reducing poverty by empowering. The vulnerability of poor people can be countered by redressing low income levels, hazardous physical conditions, social powerlessness and isolation. Infrastructure has considerable potential in this regard. For example, energy provision can improve the work and study environments, access to information via the media, and free up time, which can then be spent on productive activities. Improved transport provides access to markets, employment opportunities, social and medical services, education opportunities and friends and family." (DBSA 2006 page 22)

(Some of these are less of an issue in urban areas than they are in rural areas. In rural areas, remoteness of the poor is often an obstacle to their advancement -- remoteness, particularly, from markets and from education and health facilities. In urban areas that is not the case. The fundamental infrastructure-related environmental problems facing the urban poor are most frequently those directly related to water services.)

However, infrastructure provision does not inevitably contribute to the eradication of poverty. Ill-designed infrastructure could have more costs and benefits for poor people because of inadequate targeting or adverse social, health, financial and environmental effects. Infrastructure provision can also widen the gap between poor and non-poor people where access to services is expensive, or where infrastructure services were not planned specifically around the needs of the poor. Delivery can also be disempowering if it turns the poor into passive recipients of services rather than central actors in their own development.

International and South African case studies show that the contribution of infrastructure investment to the eradication of poverty is influenced by the way in which investment and

subsequent services are planned and managed. In short, to reduce poverty, public investment must reach poor people with the right mix of services, involving them in a way that ensures sustained improvement in their quality of life and contributes to their economic empowerment.

Notwithstanding that infrastructure might lead to greater inequality in the distribution of wealth, well-planned infrastructure is nonetheless likely to support the creation of assets and so create wealth. Take, for example, the effect of the electrification programme, resulting in a year-by-year increase in the percentage of poor households with access to electricity (cut-offs for non-payment notwithstanding).

Creation of wealth for poor people "is important because poor people have few assets that can provide them with an adequate return to ensure a sustainable livelihood. They do not, in general, have much capital and rarely own land. Furthermore, the assets the poor do possess are often of a low quality, which compounds the problem of poor returns. "An obvious aspect of strengthening assets entails capital assets, such as financial savings, housing and economic and social infrastructure. However, in South Africa, as in many other emerging economies, the poor typically find it difficult to save or to obtain finance for purchasing assets. A number of institutional innovations over the years have had varying success. Saving clubs, special indemnity and securitization arrangements were established. Policy and institutional change is necessary to address this problem and to facilitate the optimal use of available assets, enhance access to opportunities, remove distortions and improve investment returns for poor people." (DBSA 1998 page 70)

The Mzansi banking scheme, subscribed to by the four major banks and the Post Office, is surely a step forward.

Repeating from just above: "... the contribution of infrastructure investment to the eradication of poverty is influenced by the way in which investment and subsequent services are planned and managed."

There is a need for integration of water and sanitation with other efforts to reach the same project objectives. Thus water and sanitation must be integrated with the provision of solid waste disposal, roads, stormwater drainage, flood prevention, education in water and sanitation use, primary health care, education in general health care, shelter upgrading, nutrition improvements and opportunities for earning income (this list is not exhaustive).

People demand, and are generally willing to pay for, a progression of environmental services as they move up the socio-economic ladder. For example, in respect of water and sanitation services and related efforts:

- The first environmental priority of a dweller in an informal settlement is to secure an adequate water supply at reasonable cost. The demand is for quantity of water, as in assurance of supply, and not having to walk too far to fetch it. This is soon followed by the demand to secure a private, convenient, and sanitary place for defecation.
- Success in meeting these primary needs gives rise to a second generation of demands. One example is for removal of wastewater from the household, then from the neighbourhood, and finally from the city. Another example is that the quantity of water supplied being satisfactory, the demand grows for improved quality and reliability.

- Success in this gives rise to yet a third generation of demands: for the protection of the green environment, inter alia from the degrading effects of large amounts of waterborne waste.

At the project level, the economic benefits of improved water and sanitation can be substantial. Reductions in time (especially of women) spent every day to fetch water, and in household expenditures on purchasing water, are some obvious benefits.

Accompanying declines in incidence of water-related sicknesses and diseases can free scarce public resources for alternative uses. Improving the physical environment in and around the home could also motivate residents to clean, beautify and upgrade their immediate neighbourhoods.

Similar effects result from improvement in other urban services. Take electricity, for example - one has only to read a news headline such as “Toddler burnt in a shack fire” or “200 shacks destroyed in weekend blaze” or “Shack couple asphyxiated by stove” to understand that. In addition to improving safety in the home, and of the home, electricity provision can some or all of: reduce household costs (paraffin, coal and firewood are not subsidised - electricity, at the bottom end of consumption, is); reduce pollution inside the home and around the home; and reduce labour (of having to fetch paraffin etc, and carry it home).

It needs to be emphasised over and over again that these benefits from infrastructure will be whittled away by substandard operating and maintenance of the infrastructure. Sadly, this is often forgotten, for example by municipalities that chronically underbudget for operation and maintenance, and then underspend on these budgets - and do not employ staff who have the correct skills to be able to do the work.⁴

In most urban centres, it is the poorer groups that face the most serious environmental hazards and have the least possibility of avoiding them or receiving treatment to limit their health impact. In extreme cases, the poor settle in land that is shunned by others because of hazards associated with that land - for example underneath electricity pylons, in flood plains, close to waste water treatment works and solid waste disposal sites, near to polluting industrial premises. An extreme example from the 1970s was that of the households that chose to settle on top of the former Guguletu solid waste landfill site, adjacent to the N2 highway close to Cape Town International Airport. The cheapest land (for free - no one else would want to live there), and close to amenities and work opportunities - but at what a health cost!

The lower contributions of domestic users have meant that supply agencies have at times not helped obliged to provide an adequate service -- in a sense, they have felt that they are not accountable to poor households.

Another issue is that spending on services to residential areas, and especially on rollout of new infrastructure, has too-frequently disturbed the balance that should exist -

- between services to residential areas and services at the wider urban scale, such as bulk reservoirs, water treatment, and, especially, wastewater treatment; and
- between construction of new infrastructure and the operation and maintenance of existing infrastructure-- including recently constructed infrastructure.

⁴ This could, and maybe should, open up a whole discussion on operation and maintenance, on Equitable Share (which should be paying for operation and maintenance for indigent people) and related matters. But see the next section “Service quality and reliability”.

The result of this has sometimes been that areas are supplied with local infrastructure but, because of bulk capacity constraints, the expected utility of that infrastructure has not become available.

Finally, there is a need to flag that free basic infrastructure services subsidies are not available to all who should be eligible for them. There are a number of reasons for this, some of which are touched on in this report. One arises when the poor try to save housing costs by living in second or third dwellings on stands. Inevitably the later arrivals are held responsible (by the primary household) for the stand as a whole exceeding the free basic limit. Thus it is these later arrivals that have to pay the ruling tariff while the primary household enjoys the benefit of the subsidy. A municipality that is aware of this could deal with these situations as exceptions worthy of specific handling, but this is not always done.

Other instances in which basic infrastructure services subsidies are not available to all who should be eligible for them are raised later in this report.

Service quality and reliability

Infrastructure must be operated and maintained correctly if it is to provide the intended service. The economy, and the quality of life of all, are dependent on infrastructure -- which if it fails to provide the service, lands us in the kind of problem that we have now with power generation. Infrastructure maintenance (or the lack thereof) is a huge issue. Can also raise the cost -- for example cost of pipe leakage (treated water, that the water services provider pays to the bulk provider, but which water leaks into the ground); cost of potholes in terms of damage to private vehicles; cost of the power outages in terms of firstly the households' or businesses' loss of amenity and of revenue and secondly the cost of alternative provision that must be made (e.g. purchase and running cost of generators).

The topic of service quality and reliability needs to be addressed firstly in the context of the service to all, only thereafter looking at issues specific to the poor.

As the DBSA found, "while identifying some of the differences between communities and their circumstances, it was not possible to draw a direct link between specific service delivery challenges and the different types of marginal community. The line of reasoning thus focused on the challenges to service delivery in general without always trying to make the connection to marginal communities. However, it is clear that marginal communities create a more complex situation for providing infrastructure services." (DBSA 2006 page 195)

"The real problem in South Africa is not so much the availability of initial capital to fund the national municipal infrastructure programme, but rather the sustainability of the services provided. many municipalities lack the technical and institutional capacity to plan for, implement and operate infrastructure services. There is an urgent need to encourage and support municipalities to engage in regular infrastructure investment planning and to develop affordable and sustainable service delivery programmes, particularly by matching the levels of service with affordability for both consumers and the municipality/service provider. A well designed infrastructure investment plan and asset management strategy should achieve a workable balance between an affordable capital programme and sustainable operating and maintenance expenditure." (DBSA

2006 pages 178 and 179. See also page 188. "The choice of level of service must be appropriate to the social and institutional environment in which it is placed. The challenge is to determine which services are seen as priorities by the potential consumers and whether the selected services will actually meet the needs of the people.")

"Sustainable and reliable ongoing services delivery requires sufficient funds to meet operating and maintenance costs. Income may also be required to service loans for capital costs. Given the levels of poverty in marginalised communities, many consumers of infrastructure services are seriously constrained in what they can afford to pay. As a result, government has made sufficient significant budgetary provision to subsidise basic services in a way that an agreed minimum of services is available free to poor consumers. The challenge at the service delivery level, and for municipalities that are responsible for integrated service delivery, is in achieving a balance between meeting the needs of the poor and securing sufficient income to ensure sustainable services delivery. this balance is, in part, related to the appropriate choice of level of service. It also depends on functional subsidy and tariff policies together with accurate tariff setting to achieve the required income." (DBSA 2006 page 192.)

"... the infrastructure requirements of marginal communities are extensive and diverse, and ... reducing the backlogs [in infrastructure coverage] is made complex by the communities' fragile social and economic setting. In addition, most of the municipalities responsible for such communities are seriously hampered by both institutional and financial capacity constraints. " (DBSA 2006 page 195. Also, for an illustration of the kind of thing that needs to be done in, or with, challenged municipalities, see "Box 17: Some interventions for a typical B2/B3 municipality" -- Ibid. page 195)

"In South Africa, large annual capital expenditure results in an increasing number of people enjoying basic (and other) services. Unfortunately, this expansion has run ahead of the capacity to finance, maintain and manage this development. The resulting problem can be found countrywide capital works and infrastructure are falling into disrepair and collapsing.The result is that the quality of service provision to beneficiary communities is deteriorating. The deterioration is not only evident in smaller municipalities. There is, for example, a growing body of evidence from Johannesburg regarding the serious impact that electricity outages are having on the well-being of the people and economy of the city. In other towns, there is evidence of a direct link between growing unrest and the deterioration of service delivery. Poor infrastructure maintenance impacts negatively on both financial sustainability and productivity, and thus on economic output and overall social-economic well-being." (DBSA 2006 pages 191 and 192)

The reliability of services has, thanks to the impact of national shortfalls in electricity generation capacity, received greatly increased public attention during the last few months. Various estimates have been made of the costs of power outages to the national economy -- costs of lost hours of operation, of raw or partially manufactured materials that have had to be discarded, of loss of investor confidence and therefore loss of investment, of profitability declines, and of job losses. (For example: interview 2007-01-19 on "Classic Business" programme on "Classic FM" radio station: Nico Kelder, economist of The Efficient Group, stated that, as a rule of thumb for urban areas, every

megawatt shortfall of capacity costs the economy R 1 million per 24 hours of outage. Thus the outage the previous day in Johannesburg, which lasted 24 hours and was a 40 MW shortfall, cost businesses in Johannesburg the best part of half R 1 billion.)

Nonetheless, the formal sector has ways, albeit at a cost, of more or less coping with outages. However the smaller the business, generally the less its ability to cope. Also the poorer citizens generally do not have alternative coping systems, and therefore are the hardest hit by unreliable infrastructure delivery.

The DBSA 1998 Development Report discussed at some length the costs of the losses to the economy, and the costs of the coping mechanisms.

".....poor quality of infrastructure service, such as unreliable electricity supply or telephone connectivity, lowers the scale of output and therefore raises average and marginal unit costs." The DBSA quotes a 1992 study of Nigerian manufacturers. The cost of "Privately provided machinery and equipment" (because the public infrastructure cannot be relied upon to provide the service) impacts disproportionately on "small firms". The outlay on electricity generators constituted 10% of the capital investment by the average firm, but 25% of the average small firm's investment. Similar disproportion was observed in respect of boreholes for water supply, vehicles for garbage disposal, and radio equipment (this was in the days before cellphones) to substitute for telephones. (DBSA 1998 pages 37-39.)

And, indeed, the growth of⁵ cellphone coverage in South Africa can in part be ascribed to various difficulties associated with fixed-lined telephones.

Many South African microenterprises can simply not afford to make the kind of outlays on electricity generators that they might need to safeguard their businesses. Consider the simple example of a hairdressing business. To run only two hair dryers and a couple of other appliances (and not providing for lighting) requires a generator capable of 2.5 MW output. One of these can be bought for cash for R 3000, and costs about R 10 per hour to run. A very small formal sector supermarket, with a number of refrigerators, a microwave oven, and so on, would need a generator twice as expensive. Could an informal sector microenterprise hairdresser or spaza shop with refrigerator, oven, and so on, afford the capital outlay, and then the running costs? Many cannot. The result (depending on the nature of the business) of no electricity could be no income and spoiled stock.

The costs to businesses of all sizes of the coping strategies, and of their attempts to guard against loss of income and of production losses (e.g. the baker who has to throw away his batch of half-baked bread), raises the costs of their inputs and thus the price of their final product. Consumers of these products must ultimately pay for the infrastructure service failures, either through higher prices or through the absence of products that become commercially unviable.

Unreliability of services other than electricity also each require coping strategies. Water, for example, might not be so continuous a need, but large industrial premises, faced by intermittent public water supply, start to invest in on-site storage.

⁵ Storage, that is, over and above what might be required for fire-fighting purposes.

Getting back to households rather than businesses, an observer of the situation in a developing region in Asia has recently written as follows on the topic of low and deteriorating water service quality and reliability and its impact on the urban poor.⁶

“Middle income consumers begin abandoning public networks through investments in coping technologies, such as on-site storage tanks and pumps to replenish roof tanks, and on-site treatment of water. Poor households are, however, unable to make these investments. They become reliant on private water vendors and must dedicate larger proportions of their income to treat water... Those who can afford it must incur significant expenditures on coping strategies to mimic continuous supply of water, and to ensure its cleanliness. Poor households have no such luxury.

A household member must be available to capture water in any available container when supply is provided, or to meet water tankers when they arrive. Although this water is potable on arrival, it quickly deteriorates in the heat, and failure to purify it again can and does lead to the spread of waterborne diseases. Household consumption levels, among those who receive reliable water supply, are high as households capture as much water as possible while supply is available.”

The poor get income. This better enables them to get services.

That is, the poor can obtain more services if their income rises or if the cost of services falls. Incomes rising relative to the cost of services gives households greater ability to purchase what they need -- which could include more or better quality services.

The cost of services -- cost, that is, to the service authority (and/or, if appropriate, to the service provider), and also the cost to the households, is discussed in this section. Which requires coverage of both --

- cost of provision -- included in that, ways of reducing cost; and
- the charge (if any) to the household -- included in that, welfare issues such as free basic services policy (and its implementation, or lack thereof), cross-subsidisation, ways of reducing cost per household because of some form of in-community cooperation, and so on.

The cost of providing services is on a generally long-term rising trend because of rapid urbanisation and increasing demand for the service. Inefficiency of service provision, which is widespread, compounds the rise in cost.

A positive is that increasing attention (but still far too little attention) is being paid to measures to improve sustainability of services. For example the increasing attention to infrastructure asset management, and a shift from a focus on construction costs to a focus on the life-cycle costs (i.e. including operation and maintenance).

Disparity in access is generally aggravated by subsidies being applied in an insufficiently discriminating manner. As a result, many subsidies on water or sanitation service do not reach the lower-income groups for which they are intended.

⁶ Sorry: this report is confidential, and I am not allowed to give the reference.

Moreover, where such subsidies take the shape of water and sanitation provision at price levels below provision costs, the financial sustainability of the system is placed at risk. This adversely affects network extension into areas presently unserved or not adequately served, as well as the operation and maintenance of the existing network.

While not denying the importance of equity and the need to provide all people with basic water and sanitation, a recent emphasis of the international agencies has been on closer consideration of cost and price issues, of affordability and willingness to pay, and of incentives both for performance by providers and for efficiency by users.

Essential elements in the above are an efficient billing and revenue collection system, the regular uprating of tariffs, and the penalising of defaulters - together with an efficient and equitable welfare support system for the very poor.

The relationship between built form/design and infrastructure design/physical positioning

That there can be a relationship between built form/design on the one hand and infrastructure design/physical positioning on the other, and between density and infrastructure cost, can be illustrated by reference to:

- Housing density, alternative layouts of housing and infrastructure -- and cost of infrastructure services.
- Collective utility services points.

"The impact of residential density on the cost of service provision is different for each service. The total cost of water and sewerage provision, for example, increases as density increases, with larger and more expensive piping requirements. On the other hand,

because costs are shared by more users, the net cost [per stand] is lower. The cost of other services such as street lighting remains fairly constant irrespective of density (Behrens and Watson 1996). It is also found that certain services only become viable at a certain density, such as public transport, for example, which requires densities in the region of 50 to 100 dwelling units per hectare to be viable." (CSIR 2000, Chapter 5.6 pages 9 and 10).

"The subdivision and block layout have very tangible implications on the cost and maintenance of services. Not only the size of stands, but also the shape thereof has an influence on the layout and cost of services. The overall cost for infrastructure provided along any given street stays more or less the same regardless of the number of stands serviced along the street. Therefore, the narrower the street frontage of the stands, the more dwelling units and the lower the infrastructure cost per dwelling unit. It is therefore usually better to provide narrow, deep stands." (CSIR 2000, Chapter 5.6 page 6).

"Numerous subdivision patterns, like pan-handle erven [stands] or blocks with pedestrian-only routes, can increase the number of erven between road reserves. Four-erf [stand] deep subdivision patterns offer servicing [cost] advantages, as more erven can be serviced from a single service running in the road reserve. It should be noted however, that households prefer erven with street frontages because of the trading opportunities they offer, better security by being in the public view and the awkward toilet locations that can result on inner erven." (CSIR 2000, Chapter 5.6 page 10).

On the other hand, not all households want, or need, the opportunity to trade from their

residential site. Other layout and servicing devices to reduce servicing costs include mid-block reticulation of sewer and water pipes. By not having to contend with traffic loads and other services in the road reserve, services located at mid-block can be laid at shallower depths. Also, in many layouts, with toilets located at the rear of the houses, locating the water and service lines mid-block enables shorter connections. However there are sometimes disadvantages. Gaining access to the services in mid-block, for purposes of servicing or repair, can be difficult as it involves entering the private properties. Also, in lower income areas, "illegal second dwelling units which are constructed to the rear of the stands are often over the mid-block services, which results not only in additional inaccessibility but the weight of the structure on the services may also result in damage." (CSIR 2000, Chapter 5.6 page 10).

The above by no means exhausts the possibilities for the saving of infrastructure costs through housing and services layouts and the sharing of services. Other possibilities include:

- collective utility services points (see below);
- the sharing of connections by adjacent houses, with only the last metre or so being separated, in order to enter each house separately and in:
- if houses are linked (for example semi-detached, or row houses), then further savings in services costs can result;
- taking the above to the (literal) next step, even greater savings in services costs can be had in apartments, especially low-rise walk-up apartments.

Condominials take the last of these bulletpoints another step. Condominial sewerage systems depend on residents jointly allowing the systems to be built on their land, treating a block of houses like a horizontal apartment building. This reduces services construction and operation costs. The more fundamental and radical innovation that condominium brings, however, is the active involvement of households in operating and maintaining the feeder infrastructure -- therefore this aspect is discussed elsewhere in this report.

All of the options listed above save infrastructure services construction costs, yes, and sometimes operation and maintenance costs also. But they can have a downside -- such as the reduced inaccessibility mentioned above in connection with mid-block services. Decisions need to be taken in the planning and design phase, and trade-offs made -- such as: how often would the infrastructure need to be accessed, and how difficult is that access likely to be 10, 30 or even 60 years after its construction?

The "Red Book" puts forward the concept of "collective utility points" as a way of as inexpensively (for the service provider) as possible bringing selected infrastructure services to the unserved. "Where a full range of residential utilities cannot for various reasons (of which affordability is often one) be supplied to each residential site, it may be worthwhile to supply some of these at an accessible, collective point. If these utilities could also satisfy the collective needs of a taxi rank or a market, that would be more efficient -- but such a situation would be the exception. However, it is very likely that, at even a lower-order collective utility point, a couple of small entrepreneurs will set up -- selling food, or providing a repair service, for example." (CSIR 2000 Chapter 5 page 3)

Services at such collective points could include public standpipes, public telephones, mail collection points, solid waste collection and recycling points, metered electricity dispensers, and public toilets.⁷

Alternative technologies

Alternative technologies abound -- the question is their suitability for the particular circumstances at any location. Which involves issues of acceptability of the technology, appropriateness to e.g. ground conditions, its cost (not just installation cost, but running cost), the skills required to install, operate and maintain it.

The section: "Principles of the provision of public infrastructure" asked a number of pertinent questions -- issues to be considered in technology choice.

There are many alternative technologies, and even more opinions as to their suitability. In respect of on-site sanitation alone, one recalls the VIP (Ventilated Improved Pit latrine) and its many variations, the aquaprivy and the Enviro-loo. Chapter 10 "Sanitation" of the "Red Book" discusses these, their advantages and disadvantages, and principles to be applied in their selection, construction, operation and maintenance. This report is not the place to do a survey of these, nor of alternative technologies in water, energy or any of the other infrastructure services. Rather refer to the appropriate chapters of the "Red Book". (Which, although the principles are still valid, for obvious reasons the book does not capture the latest technological developments.)

Many of these alternative technologies confer (or are portrayed as conferring) different levels of service.

Undoubtedly there is a need for further work on alternative technologies -- not necessarily research and development of new technologies, but capturing experiences of their usage.

Recent attention has focused on alternative energy sources. The "Red Book" Chapter 12.2 "Other forms of energy" clearly sets out principles in choosing, for example, different fuel systems for domestic cooking and heating (Chapter 12 page 3). The costs, and particularly the relative costs, of the different fuel systems have changed completely over the last decade, and look to be changing drastically in the near future, given the very recent proposals by Eskom for hiking its prices, and associated issues.⁸ Also, at the lowest end of consumption, grid electricity costs the users nothing (thanks to "free basic electricity"), whereas alternative energy sources have risen steadily in cost. Which again draws attention to the situation where those fortunate enough to live in homes that are accessed by subsidised services are enjoying the intended subsidy, but those in homes not so accessed do not benefit from the subsidy - - surely an inequitable situation.

(Admittedly, given the urban context of this report, homes in these areas that are not electrified constitute a very small proportion of all homes not electrified.)

⁷ See "Red Book" Chapter 5.7 "Public utilities" for the whole description of collective utility

⁸ It would be of great interest to see an updated version of Figure 12.2.7 "Comparative energy costs for single installations (1997 rands)". (CSIR 2000, page 19)

Levels of service

Far more important is the level of service⁹. Determination of the appropriate level is also a decision that needs to be taken in respect of particular circumstances at the location. Issues to be taken into account include the same set as above. Acceptability can in South Africa be a very political issue, with expectation on the part of many poor communities and their political representatives that they will receive a higher level of service than simply basic. This can for example imply an expectation, even in water-stressed areas, that households will receive waterborne sanitation.

Resolution of this should be through mechanisms such as the Integrated Development Plan (IDP), the (recently introduced) Comprehensive Infrastructure Plan (CIP)¹⁰ and the Water Services Development Plan (WSDP), which are among plans each municipality is statutorily obliged to prepare. In practice, however, these plans individually, and their integration, usually leaves much to be desired. Strong efforts have been made in recent years by National Treasury and DPLG to improve municipal planning practice

The poor get income from playing a part in the service provision chain.

That is, the poor earn income through building, operating or maintaining the infrastructure, or through selling the service.

If the scale of the technology is reduced, there is a greater potential for community-based involvement in operating and maintaining the infrastructure. If the technology does not have major capital requirements, community groups and small private enterprises (referred to as "microenterprises") will usually be able to provide the services competitively, maybe even provide them more efficiently, more cost effectively or more equitably. Almost certainly the proportion of income going directly to the local community members would be substantially increased.

Adequate institutional provision for service provision involves diverse skills and capabilities, many public and private actors, and a range of tools for capacity building - some of these may have to be innovative. Promising directions include partnerships in which informal institutions (such as neighbourhood associations) manage the feeder infrastructure, while formal institutions (such as governments or utility companies) manage the bulk and link infrastructure. Finance must be appropriate -for example, microloans for household-scale sanitation improvements.

There are diverse means whereby the poor can get income directly from being part of the service provision chain. But the case for investigating using the community organisations, microenterprises and individuals all drawn from the urban poor is strengthened in that it could bring other benefits. There could well be as many as four effects, as follows --

- creating income-earning opportunities for the poor, yes; but also
- reducing cost of service;
- improving reliability (included in that, if local people have responsibility for ensuring that the service operates properly, through ways (to be explained) the incentive to ensure service reliability is increased); and improving access.

⁹ Level of service, and other topics of this report, such as alternative technologies, have over the years been well covered in other fora. The interested reader is invited to google to find the extensive literature on these topics.

¹⁰ "The Comprehensive Infrastructure Plans addresses sustainability in terms of the technical, environmental, institutional, financial and social economic issues involved in service delivery, taking cognisance of the integration and interdependencies between the different services." (DPLG 2008.)

Some issues to consider:

- Alternative institutional means of providing services-- e.g. kiosks or travelling vendors (as opposed to pipe systems, or people having to go to where the service is available, and themselves bringing it back to where it is to be used).
- Local communities taking responsibility for operation and maintenance in respect of their local areas. (Which might require different design and construction parameters.)
- Small contractor development programmes -- how these could be enabled, how these could be designed, how these could result in sustainable contractors.
- The potential that lies in housing and infrastructure upgrading.

This section considers these and related matters under the headings of “infrastructure new construction (mostly)”, “infrastructure maintenance” and “infrastructure operation”. The principles are common to all three.

Infrastructure new construction (mostly)¹¹

"For many poor people, labour is their only viable asset, and it provides their only means of securing a sustainable livelihood. Effectively developing this asset requires very specific investment. We noted above that infrastructure, among other factors, can play a role in this regard through increased access to education, training, health services, communication and energy. The importance of education and training to improve the skills levels of potential workers is often emphasised. However important this may be for long-term job creation in a competitive economy, it will have to be supplemented by other strategies, and specifically by efforts to enhance the growth prospects of labour-intensive industries." (DBSA 1998 page 70)

"What role can infrastructure play in reducing these problems? It can contribute, but only in the context of an integrated approach. Factor substitution [i.e. substitution of capital for labour by mechanising] is the outcome of a complex interplay of forces, including relative factor prices and the characteristics of the labour and capital markets. Ringfencing the role of infrastructure in these dynamics is not easy. First, infrastructure encourages or enhances economic growth and structural change and thus contributes to the creation of associated employment opportunities. Second, the provision of infrastructure creates employment during construction as well as [in subsequent] maintenance." (DBSA 1998 p 70)

DBSA discusses the "role for infrastructure as an agent of employment-creating and poverty-reducing economic growth." It notes that: "Infrastructure investment will help the poor if it is managed, financed and priced to do so" (DBSA 1998 page 71)

The South African government's job creation and employment programmes through the construction of infrastructure have been premised on the knowledge that construction can often be undertaken in a more labour-intensive way in order to maximise opportunities for the generation of wage income, and, further, wage income combats poverty.

¹¹ The “mostly” is to allow for this section to cover issues common to construction, operation and maintenance.

The DBSA 10 years ago stated that: "Thus far employment expectations have failed to fully materialise. Data on employment rates and employment opportunities are also insufficient, and concepts such as 'jobs' and 'employment opportunities' are often ill-defined. This makes it difficult to compare projections and reports of progress. Nevertheless, there are distinct indications that substantial creation of employment has occurred through investment in infrastructure in South Africa during the past decade." The DBSA report then proceeded to list various programmes, and estimated the jobs created (usually measured in person-years) by each thus far. (DBSA 1998 pages 72-76)

Very interesting also is the DBSA's listing of, and brief discussion of, the tradeoffs that must be made. For example:

- That the difference between providing relief and achieving long-term development benefits must be understood, measured and reconciled.
- That the effect of payment levels must be understood, inter alia because of their effect on the financial viability of labour-intensive approaches when compared with capital-intensive construction.
- That construction offers ample opportunities for first-time job experience, but its capacity to do so is often shaped by particular circumstances.
- That one form of empowerment is through community-based works in which responsibility for project choice and project management is transferred to a community committee. However, whereas the principle is sound, the practice is often complex.
- That community empowerment and the use of emerging contractors should not be to the detriment of technical standards. (DBSA 1998 pages 74-77)

"These observations and experiences suggest that infrastructure investments and projects have the potential to contribute to employment creation, both directly and indirectly. However, initial expectations have to be tempered by the recognition that labour-intensive approaches place high demands on managerial capacity and technical design to assure quality and long-term benefits. [Furthermore] Economic and social infrastructure services can reduce poverty and contribute to job creation by supporting economic activity, human development and wealth creation.[Nonetheless] These effects of infrastructure are not inevitable, but depend largely on how infrastructure services are planned, managed and financed." (DBSA 1998 page 77)

Writing eight years later, McCutcheon et al stated bluntly: "In 1994 the new democratic government launched its National Public Works Programme. This programme failed to achieve its major objective of re-orienting public expenditure so as to generate employment and skills. Unfortunately, the responsibility for infrastructure was located in a department that was not responsible for infrastructure but public buildings. Once this had been realized the department concentrated its efforts upon community based relief and small contractor development. The major construction industry was not involved. The effect of the National Public Works Programme was not perceptible in the major economy." (McCutcheon et al 2006 page 4)

Despite that, he is optimistic with respect to the EPWP, because the groundwork has

been far better laid. In particular, the labour legislation necessary for a successful public works programme, and other documentation such as a code of good practice, are now in place. (McCutcheon et al 2006 pages 4-5)

In respect of analysing the impact of public works programmes, as in respect of various other issues discussed in this report, it is not really possible to separate out the urban aspects from the national overview. Thus, in respect of the Expanded Public Works Programme (EPWP) it has not been possible to distinguish between, for example, jobs created for the urban-based poor as compared to jobs created for the rural-based poor.

McCutcheon et al described the potential of the EPWP to generate productive employment opportunities, increasing "the potential of participants to earn a future income by providing work experience, training and information related to local work opportunities, further education and training and SMME development", and targeting "the unemployed and marginalised". (McCutcheon et al 2006 page 7)

They found it necessary, however, to start by addressing expectations. (McCutcheon et al 2006.)

"The concept of work opportunities is subtle and will probably continue to be misconstrued. Equally, insufficient attention is being paid to the fact that the EPWP is intended to provide an opportunity for those who are unemployed to be able to make a first step on the first rung of a ladder leading to sustainable employment. From the misconceptions apparent to date, it is quite clear there needs to be a huge investment in public relations and communication between the Programme and the public. If this does not happen, expectations will be too high.

"The Programme intends to contribute to the generation of skills and job opportunities for the currently unemployed. It does not pretend to be a panacea. That would be unrealistic given the fact that South Africa's gross domestic product is about R1 480 billion and the annual expenditure on the EPWP as a whole will be about R4 billion or less than 0,3 percent of national GDP. For infrastructure it will amount to R3 billion.

"The turnover of the SA civil engineering industry is currently of the order of R25 billion. It employs about 90 000 people. Thus for R3 billion it would employ about 11 000 people. For the same R3 billion, the infrastructure component of the EPWP will generate between 30 000 and 45 000 employment opportunities. This will not solve the unemployment problem but it does show that there are ways of generating significant additional employment opportunities within the existing major economy.

"In addition to the need for the objectives and scale of the Programme to be explained to the media, they need to be understood by politicians at local, provincial and national levels. If the politicians do not stand firm, there could once again be a return either to superficial numbers games or 'business as usual'; or, a variant of the latter in which conventional capital-intensive projects are simply labelled 'labour-intensive'. ...

"Thus, part of the concerted public relations exercise to educate the public has to be carried out by the politicians who are responsible for the Programme at the local level. This campaign would include explication of the nature of the things that need to be in place before productive employment opportunities can be generated. If this does not happen, local expectations will be too high. Once again, we could see a change in either the policy itself, or more likely, since the song remains the same, a faltering in the adoption of

a sensible long-term strategy.

“The success of this Programme should not be judged by unrealistic criteria. It is unreasonable to expect that the expenditure of less than a half a percent of South Africa’s annual GDP could solve all the country’s problems. The programme must be assessed in relation to the extent to which the expenditure of R3 billion per annum achieves its own objectives. If it does so, it can ask whether other public monies have been structured in such a way as to generate similar increase in much needed employment, while also fostering skills and delivering high quality products.

“As indicated above, attention has already focused upon the numbers, whereas if work opportunities are to be provided for a large number of people a range of other factors take precedence. [In particular,] ... linkages between training, conditionalities and documentation.” (McCutcheon et al 2006 pages 13-14)

McCutcheon made it clear that there are no quick fixes to be obtained from labourintensive programmes, and, further, that labour-intensive programmes themselves require long-term planning and implementation. Although policy and legislation are in place, it will take a long time before labour-intensive methods are adopted on a large scale. The main reason is that “extensive re-engineering” of the construction industry is required. The productive use of labour as a “design driver” in the construction process has to increase significantly. This necessitates collaborative action by all of those responsible for the delivery of public infrastructure: client authorities, consultants and contractors. For example:

- Consultants must produce appropriate designs and contract documentation prior to calling for tenders.
- Contractors have to learn to price labour-intensive tenders and then execute the work efficiently. In order to be able to do so they need to employ properly-trained “hands-on” site supervisors capable of organising and managing the use of labour-intensive methods.
- Clients must adopt a positive attitude towards innovation, and there needs to be building of appropriate capacity within the client bodies. For example, the processes leading to the release of funds must be improved -- even where contractors have been willing to innovate using labour-intensive methods, they have not been able to do so because clients have not given them sufficient lead-in time for them to generate the internal resources to respond. Lack of continuity of funding from financial year to financial year has also up to now been a problem. (McCutcheon et al 2006)

Which is not to deny that construction, and operation and maintenance, have always had substantial labour components - in some respects diminishing over the years, as greater mechanisation has taken place, but nonetheless still very significant.

There is no shortage of guidelines for increasing job creation on construction, operation and maintenance programmes both in terms of the number of people who can be employed, but also, more important, in terms of the sustainability of the employment that is created and of the infrastructure that is created or operated and maintained.

A good example, albeit on sanitation services, but nonetheless providing guidelines largely common to all civil engineering infrastructure, is “the creation of jobs on sanitation projects: a guideline for municipalities” (DWAF et al 2005). This usefully overviews, in a few

pages each, topics including the following:

- “What can be done differently to create more jobs on sanitation projects”, including the manufacture and supply of materials by small enterprises, and the development of a career path for builders;
- How to make job creation more sustainable, including providing training opportunities, adequate mentorship, municipal budget planning, using the workers on other municipal projects, etc;
- Choice of sanitation technology, and implications thereof;
- Alternative institutional approaches, including microenterprises and community based cooperative businesses; and
- Monitoring and reporting.

Finally in this section, turning to designing for labour-based construction. The "Red Book" describes this, and recommends that the technical consultants for infrastructure feasibility studies should be required "to report on the economic implications of using [labour-based construction] designs and, thereafter, [if appropriate] to design a project based on designs and technology appropriate for construction that maximises labour-intensive methods". (CSIR 2000, page 51)¹²

Examples are given of the "employment potential" of various types of roadworks and of different pavement layers. (Ibid, pages 52 and 53)

Examples are also given in the roads sector of "typical activities suited to" microenterprises. (Ibid page 54)

Infrastructure maintenance

Turning from the employment possibilities in infrastructure construction to the employment possibilities in infrastructure maintenance: there is a massive need for infrastructure maintenance. All infrastructure sectors have significant infrastructure maintenance backlogs - some much more than others.

Late in 2006, the South African Institution of Civil Engineering (SAICE) released the first ever “report card” of the state of infrastructure in South Africa. This report highlighted “the observations of the professionals responsible for the planning, construction, operation and maintenance of our nation’s life-support system”. It graded infrastructure on a scale from A+ through E-. Overall, it gave South Africa’s infrastructure a D+ grade. (SAICE 2006)

The 2006 report is a reflection at a point in time on the state of South Africa’s built environment infrastructure, i.e. that part of the nation’s public sector capital stock that produces services consumed by households, such as hospital services, drinking water, sanitation, electricity, or that which facilitates economic activity, such as electricity, roads and ports. This infrastructure is a public asset.

All South Africans have a stake in its upkeep and operation, and all of us share in the expense of its construction and its ongoing maintenance.

¹² This section in the "Red Book" appears in Chapter 8 "Roads: materials and construction". But the principles described are nonetheless applicable to some or other extent to all infrastructure sectors.

Well-maintained infrastructure underpins quality of life and economic development. The purpose of the report card was to draw the attention of government, and of the public at large, to the importance of maintenance, and to factors (such as skills and finance) underlying the state of repair of infrastructure - and to the potential for very worthwhile job creation in infrastructure maintenance activities.

“While the importance of the provision of infrastructure to support socio-economic growth has to date been well recognised within government, the potential of infrastructure maintenance as a powerful tool of economic growth and service delivery needs to come more to the fore. Infrastructure maintenance must be regarded as a strategic tool to promote improved service delivery, to unlock funding to extend infrastructure to historically disadvantaged communities, and to support the nation's economy. Maintenance of existing infrastructure should not be seen as of secondary importance to the apparently more attractive prospect of new infrastructure.

“Appropriate infrastructure maintenance also creates jobs. For example, maintenance needs to be done year after year, and personnel to do this maintenance will therefore always be needed - not just for the limited period of construction, but also for the whole of the designed life of the infrastructure. Furthermore, much maintenance can only be done, or can best be done, by labour-intensive methods, and it is thus important that government's plans for employment creation give prominence to maintenance. Finally, there is substantial scope for maintenance contracts to promote SMME development, Broad-Based Black Economic Empowerment (BBBEE), involvement of women and youth, and local employment coupled with appropriate enterprise development.

“Based on a conservative estimate of 12 equivalent full time jobs per million Rand (6 direct and a further 6 indirect or induced), it is estimated that a maintenance budget of R20 billion will provide employment to approximately 240 000 people for a year. Where labour-intensive methods are appropriate, for example on civil engineering works, much greater levels of employment are attainable (approximately 50 jobs per million Rand).

“Maintaining infrastructure comes at a cost, but this is a prudent investment which will save government significantly in the medium to long term and will promote both economic and human capital development.” (“National Infrastructure Maintenance Strategy”, DPW et al, 2006, pages 5-6)

It is not difficult to show that in many instances the service delivery agencies are not meeting the needs of the urban poor, or are consistently not complying with minimum quality and reliability norms. For example, those municipalities that have not yet extended free basic services to all that should be receiving them. For another example, the national parastatal that so grossly failed to provide for growth in electricity generation capacity, and is only now seeking proposals from alternative possible suppliers. For a third example, those municipalities that consistently fail to comply with the standards specified, in the licences granted to them by DWAF, for effluent from wastewater treatment works - to the detriment of users of groundwater and downstream service water.

These current service delivery agencies need more strictly than has been the practice hitherto to be called to account. Ways in which they can be assisted need to be actively followed up on - in some cases, they need to be compelled to call for assistance - if indeed such appropriate assistance can be available.

However, there is often reluctance to seek assistance. For example: recent WRC research has found evidence of reluctance of many municipalities to outsource functions that they themselves are consistently failing to perform, or to perform anything like satisfactorily. These municipalities use procurement regulations and procedures to justify their reluctance to innovate.

This needs to be addressed. Starting with review of procurement regulations and procedures (e.g. Section 78 of the Municipal Systems Act). Which appears to be used to resist outsourcing not just to the microenterprise sector but also to CBOs.

It is not much good having a programme for training microenterprises, drawn from the local urban poor communities, in infrastructure service operation and maintenance, if the municipality won't appoint them, but prefers to continue doing the tasks in-house.

Jones et al have suggested reasons for "civil society groups and non governmental organisations, although present, [being] relatively subdued members of the [water services operation and maintenance] partnership." Private sector consultants and contractors have been heavily involved in the design and construction of water services infrastructure, but not much in operation and maintenance. There is on the part of local government a "hostility to civil society in general (including NGOs and CBOs) that extends beyond the advocacy and "watchdog" roles to the service and "software" delivery functions that they have played in the past. Section 78 legislation makes it very difficult not only to engage the private sector, but any external provider including NGOs." (Jones et al 2005 page 29)

The "Red Book" also points to the employment potential of infrastructure maintenance. "Maintenance activities", it states, are often "ideally suited to manual labour", because they may be "simple procedures to be carried out with the proper training and equipment". Examples are given, again in the roads infrastructure sector, of maintenance activities suitable for labour and/or for microenterprises. (CSIR 2000, pages 54-58)¹³

Infrastructure operation

The national Department of Water Affairs and Forestry (DWAf) has stated that institutional reform of the water services sector "will result in the creation of a diverse range of institutional arrangements appropriate to the specific and diverse local and regional contexts within South Africa. Some possible arrangements are outlined below without any intention of being pre-emptive or prescriptive. The list is by no means exhaustive, and is indicative only. No expression of preference is intended in terms of the ordering (or any omissions) of the alternatives. Combinations of alternatives are also possible. The appropriate institutional arrangements will be defined on a case-by-case basis." (DWAf 2003c, page 20).

Having listed a number of these possible arrangements, DWAf went on to state that "government is committed to promoting the active involvement of civil society in the provision of sustainable and affordable water services", and that "this will be done through", inter alia, "engaging capacitated community-based organisations to manage water services projects at the local level, where appropriate". (Ibid page 25).

¹³ On page 57 is a drawing of appropriate technology (for maintenance of tertiary road surfaces) using ad hoc materials to build blades for grading the roads, as opposed to using a mechanical grader. This serves to illustrate the kind of thinking that will enable microenterprises to, at a basic level, perform infrastructure maintenance.

Furthermore that: "Where water services are provided through smaller localized systems, it may be most appropriate for these services to be managed by the local community with support from the water services authority or water services agents. ... DWAF will engage with other national government departments to secure the right of water services authorities to use community-based water services providers (as defined in this Strategic Framework) **without undertaking competitive tendering.**" (ibid page 20). (emphasis added)

Despite that "the current policy environment of municipalities encourages local contracting of small service providers", "local authority initiatives that include community-based service providers remain scarce". And also despite advantages, such as that "local small service providers have an innate ability to respond to the dynamics of market need and demand that characterise informality". (Cousins 2006 page 5). "Distinguishing between voluntary payment as beneficiaries or remunerated employment for providing services", Cousins identified a limited number of situations where microenterprises provided operation and maintenance services, invariably to undertake low-skilled tasks such as collection and emptying of buckets. (Ibid pages 6 and 10). Mentoring, if any, of these emergent contractors, is invariably by the municipality.

All other instances that the author has discovered of mentored microenterprise operation and maintenance of water services in South Africa have been at this low-skilled level.

Despite the moral lead given by DWAF, operation and maintenance of municipal water services by not only the private sector but also by non-governmental organisations (NGOs) and CBOs is very much the exception rather than the rule.

"Civil society itself is not particularly organised and is divided between taking up a service provision function or a stronger advocacy and watchdog role. A perceived lack of "professionalism" and low capacity also make them look bad (compared to professional "service providers) in the eyes of municipalities.

"The private sector is not as large a player as one would expect, neither in service delivery nor in a support function to municipalities. Apparently "service providers" have been banned from several of the provincial fora largely as WSAs are hostile to their presence. Some NGOs have had to seek national intervention in order not to meet the same fate. Thus the scope of the sector is in fact much narrower than one would expect and heavily dominated by government or parastatals. This has several consequences, most significantly in reinforcing a top-down centralised approach and placing priority on expenditure and planning over the efficient and sustainable delivery of services." (Jones et al 2005 page 29)

South Africa differs from many other countries, where small and microenterprises have since time immemorial provided many services that are nowadays more generally associated with provision by the public sector. These services included operation and maintenance of the means, including infrastructure, whereby the populace access water and waste services.

Today, "in many cities of Africa, Asia and South America, more than half the population of towns and cities obtain their water from suppliers other than the official water supply utility. Numerous terms have been used to describe the various different types of unofficial service providers Small Water Enterprises

(SWEs). SWEs are private enterprises, usually operated by small-scale entrepreneurs (with a maximum of 50, and usually far fewer employees), which earn money from the sale of water. They usually supply water to places that are unserved or inadequately served by the utility, or at times when the utility cannot. Customers are not necessarily the poor..... In many cities, however, it is low-income households that are worst served by the utility and most dependent on SWEs." Three broad categories of SWEs are wholesale vendors, distributing vendors and direct vendors (including operators of water kiosks). (McGranahan et al 2006 page 2).

SWEs generally receive little support from governments, and "the incremental but critically important improvements they can provide tend to be overlooked by governments and international agencies." (McGranahan et al 2006 page 1). Nonetheless, there are a number of examples of SWE creation being nurtured by governments and public sector agencies, or of SWEs being financially supported or being preferentially procured, or both, to the benefit of the SWEs, and resulting in improved service. (Wall, 2005 page 61 and Section 4.3) and (World Bank 2005.)

Recognising the great impact that even marginal improvements in water services delivery through SWEs, if disseminated, would have on the many millions who depend on these water services providers, WEDC, with financial support from Department for International Development (of the UK government) (DFID), identified and tested ways of improvement. In each of four African cities, teams "have worked to identify constraints, opportunities and strategies for enabling small water-providing enterprises to deliver acceptable water services to low-income urban consumers. The accumulated evidence suggests that there are numerous opportunities for enhancing the role of SWEs in all of the cities." (McGranahan et al 2006 page 3)

These opportunities lie in:

- the official attitudes to SWEs;
- the technology environment; and
- the financial environment.

The first of these has the greatest potential by far. The right kind of change in official attitudes would greatly improve the environments towards technological and financial strengthening of SWEs.

"Government agencies have long been inclined to ignore or suppress SWE. They have not traditionally been considered to be legitimate suppliers. The goal of the utility has been assumed to be one of replacing rather than assisting the SWE. Often, the illegitimate character of SWEs has inhibited the investments that would improve the reliability or quality of supplies. This lack of investment applies to both the utilities, who fail to invest in servicing the SWEs, and to the SWEs themselves, who cannot secure finance at competitive rates." (Ibid pages 3-4)

Quite apart from the benefits to the SWEs and to the customers that they serve that would derive from governments (and their public sector utilities) and SWEs working in cooperation, the utilities can also expect to benefit from higher revenues, as SWEs become legitimate and reliable paying customers, and invest in better equipment.

The WEDC study identified measures in the following areas for the improvement of water services supply by SWEs:

- improvement of the quality and reliability of the sources from which the SWEs draw their supplies, and easing the access of SWEs to these sources (e.g. simple things like queuing facilities for water carts);
- official recognition, where appropriate, of the value of the service, and of the legitimacy of the SWEs;
- increased investment by SWEs (which investment, as the study points out, SWEs are more likely to get if they are legitimate than if they are not);
- technical support;
- regulations, and their enforcement, that improve quality and reliability, rather than regulations that simply harass the SWEs (as it is reported frequently happens); and
- measures that facilitate entry of new SWEs, in order to improve coverage, choice available to customers, and probably also price and quality competition (such measures would include subsidising fees for drawing from the water sources, and reducing bureaucracy and eliminating corruption in the granting of licences).

The WEDC study identified the following advantages, not directly to do with improving the quantity, quality and reliability of the water services, of growth in the SWEs sector:

- improved revenue to the owners of the sources (often the public sector utility); and
- employment creation, particularly in delivery of water from non-piped supply.

"To seize these opportunities, however, will require significant changes in relations between governments, SWEs, water utilities and in some cases other actors." (McGranahan et al 2006 page 3).

As noted earlier, possibilities exist in South Africa for microenterprises to sell and/or operate and/or maintain services other than water services - e.g. roads, transport, solid waste collection, building, and energy (including electrical and solar) installations.

A more radical dimension of responsibility for infrastructure operation, unknown in South Africa, is where residents, rather than community-based organisations or enterprises, take responsibility for operation of an infrastructure service (or services) in the area in which they live.

Mentioned above is the Brazilian "condominial" system, dependent on residents jointly allowing the sewerage system to be built on their land, treating a block of houses like a horizontal apartment building. This reduces services construction and operation costs. The more fundamental and radical innovation that condominium brings, however, is the active involvement of households in operating and maintaining this infrastructure.

Briefly, all operation and maintenance activities are carried out by local residents. To illustrate - if a sewer blocks, there is no question of calling the municipality to come and assist. The resident previously designated to keep the clearing equipment at his house is called, and he and his children and the neighbours affected by the blockage then constitute the gang that will clear it.

ABOUT QUICK WINS

Briefly – there are no broad-based quick wins to be had. Yes, in individual situations there is much scope for quick wins. For example:

- Substitution in a particular municipality of a key official or a change of leadership of a municipal portfolio committee, could bring greater skill, effectiveness and/or accountability;
- The opening in an area of a new avenue for lending to microenterprises could enable them to capitalise on an improved water supply, or could enable them to purchase backup electricity generators where these are needed;
- A municipality that cannot cope agrees to hire small maintenance contractors;
- Or simplest of all, a broken pipe is fixed, or transformer capacity is doubled in a suburb. But as to some measure that will constitute a quick win with national impact --none of these could be identified. The measures identified all require sustained effort over a period of time. This is reflected in the recommendations of this report.¹⁴

RECOMMENDATIONS

The principles of the provision of public infrastructure¹⁵ must underlie important decisions on the provision of infrastructure services in urban areas for all in society and in the economy, especially the urban poor.

The urban poor can gain access¹⁶ to the benefits of services in several different ways¹⁷, and therefore a programme to enhance access should if possible not be limited solely to one or other of these - dependent of course on consideration of the particular circumstances of any community.¹⁸

Conversely, the urban poor are particularly vulnerable to fluctuations in service quality and reliability. In the interests therefore of these poor, but also in the interests of the quality of life of all citizens and of the economy, much greater efforts than hitherto should be made to ensure service quality and reliability. However, just in case, there should also be support programmes targeted at the urban poor, to cushion them against the effects of these fluctuations. These programmes would need to be in all spheres of government, and at various levels as needed.¹⁹

¹⁴ Examples that will require sustained effort over a period of time include: national implementation of a broad-based infrastructure asset management strategy; and the passing of legislation that is more facilitative of outsourcing of infrastructure services operation and maintenance.

¹⁵ As set out in the section “Principles of the provision of public infrastructure”.

¹⁶ As defined in the section “What is meant by ‘access’, and by ‘improving access to services’”.

¹⁷ That is, the three ways that “the poor” in urban areas and “urban services” interface - as set out in the section “Ways in which the poor and urban services interface”.

¹⁸ For one example only, consider the financial aspects of a programme. This could include microloans for household-scale sanitation improvements or for equipping an entry-level

¹⁹ A simple example, at the level of a municipality or even a suburb, would be that in the event of a protracted interruption in the reticulated water supply, there should be the immediate introduction of a tanker service.

Given how essential it is that infrastructure be empowering rather than disempowering, and that delivery can be disempowering if it turns the poor into passive recipients of services rather than actors in their own development, there should be strong encouragement of ways in which the urban poor can earn income directly from being part of the service provision chain. Depending on the circumstances, this could require a number of proactive measures, including programmes to develop and grow microenterprises and small CBOs in ways that are most effective for them to deliver the service and at the same time to be sustainable²⁰.

Another measure could be undertaking work in a more labour-intensive manner. All these, in turn, require generally much improved conceptualization and implementation of, for example, procurement procedures, microenterprise financing, and design and packaging of tasks in order to make them appropriate for individuals, organisations and enterprises based in the urban poor communities to undertake them.

Further to the point immediately above: The great potential to enhance the access of the urban poor to services through their employment on infrastructure maintenance must be recognised. The National Infrastructure Maintenance Strategy spells out a range of measures needed to make this “prudent investment which will save government significantly in the medium to long term and will promote both economic and human capital development” (to quote the Strategy). This report is not the place to enumerate these measures, but, if only two may be named, these would be:

- Require owners of infrastructure to make adequate financial provision for maintenance of that infrastructure; and
- Build capacity, through means such as learnerships, mentorships and other forms of skills and contractor development programmes.

Infrastructure must reach communities with the right combinations of services, and the right levels of service. Too often in South Africa, expectations far exceed real need, and even further do they exceed affordability, with the result that some communities are given inappropriately high levels of service, which then can't be sustained, subsidies notwithstanding. Subsidies need to be applied in a more discriminating manner - in particular, they must reach the lower-income groups for which they are intended. More effective preparation, and implementation, of plans such as the IDP, CIP and WSDP, should reduce incidences of this kind. More needs to be done to investigate alternatives - such as alternative technologies and alternative planning and servicing concepts (examples are given in the section “The poor get income. This better enables them to get services”) - and then to implement them, and monitor and evaluate the results.

There is a great need for new concepts of servicing the urban poor, and for these concepts to be piloted, and the lessons learned and disseminated. The role of agencies independent of those institutions currently providing the services needs to be recognised, and, if appropriate and if they can show that they can better meet the needs of the urban poor, the agencies should be rewarded with additional responsibilities and resources.

²⁰ For example the concepts of microenterprise franchisees, developed by the WRC, for operation and maintenance of water services infrastructure.

They need, infrastructure construction or maintenance enterprise or CBO. again where appropriate, greater freedom to pilot where warranted. Especially where it can readily be shown that current service delivery institutions are not meeting the needs of the urban poor, or are consistently not complying with minimum quality and reliability norms, the current institutions should be compelled to call for assistance - if indeed such appropriate assistance can be available.

Finally: The sector leaders in respect of much of all of these recommendations are national government departments and national parastatals, and they need to give more attention, and more skilled attention, to formulating and implementing what they need to do, especially in respect of monitoring and evaluating, incentivising, guidelines and performance benchmarking, and regulating.²¹ The sector leaders' role could, and should, include guiding municipalities, and/or discovering municipal good and bad practice and disseminating lessons therefrom.

²¹ For example the strong efforts made in recent years by National Treasury and DPLG to improve municipal financial planning practice, by DWAF to monitor the performance of water treatment works, by CIDB to screen and also to assist emerging contractors, and by DPW and others to promote labour-based construction.

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