

## Is the water flowing? Equity and efficiency in rural water services

### **Dr. David Hemson**

Human Sciences Research Council  
Private Bag X07, Dalbridge, 4014  
750 Intuthuko Junction, Cato Manor, Durban  
Tel. (0)31 2425612; Fax: (0)31 2425402  
Cell: 0845950376  
[dhemson@hsrc.ac.za](mailto:dhemson@hsrc.ac.za)

### **Kwame Owusu-Ampomah**

Human Sciences Research Council  
750 Intuthuko Junction, Cato Manor, Durban  
Private Bag X07, Dalbridge, 4014  
Tel. (0)31 2425604; Fax: (0)31 2425402  
Cell: 082 3640048  
[kowusu-ampomah@hsrc.ac.za](mailto:kowusu-ampomah@hsrc.ac.za)

2004/05

This paper examines the problem of accessibility and sustainability of water service delivery in rural communities in post-apartheid South Africa. Very often statements are made that water services do not reach the poor, mostly rural populations; quality of services is poor; rural water projects are unsustainable, and as a result rural populations become more vulnerable to water-borne diseases. This raises problems of social equity, health and the wellbeing of rural populations, and the efficiency and effectiveness of municipal management in the provision of water services. The objectives of the paper, therefore, are to

- Explore the link between the notions of equity and efficiency of municipal managers in water services delivery in rural communities;
- Assess the government's achievements in water service delivery in the past decade through the extent to which the regulations, benchmarks and policy guidelines and goals - as set out in the set of statutory instruments and policy framework on water provision - are being met;
- Answer pertinent questions often posed in debates on water provision, e.g. whether the water systems are working or not; whether water services are working efficiently or not; the distinction between 'efficiency' and 'effectiveness' of municipal water management etc.

Water service delivery and operations are undergoing a critical transition; the epicentre of direction is shifting with increasing rapidity from national government to municipalities. The transition is not a simple rearrangement from national to local; an associated element is a shift

between Department of Water Affairs and Forestry (DWAF) to that of the Department of Local and Provincial Government (DPLG); in terms of policies, business plans, administrative arrangements, and hierarchy of responsibilities. The re-arrangements within the sector herald the centrality of municipal government, which is now responsible for many of the life sustaining services in the delivery chain. Although responsibilities and fundings shift from one political-administrative centre to another, the requirement of delivery is ever as acute, particularly in rural communities.

The paper uses data from the Human Sciences Research Council's 2003 South African Social Attitudes Survey (SASAS) which permit the analysis of people's attitudes to quality of water services, and with appropriate adjustment with household weighting, also provide comprehensive information on the nature of water services and the beneficiaries attitude to these services. The data also permits the measurement of public perception of the government's performance in service delivery, through the proportion of people that is satisfied or dissatisfied, their profile, where they are located, and the reasons for their dissatisfaction.

The paper finds evidence that there are managerial difficulties in ensuring the sustainability of rural water infrastructure and services. In other words there is evidence that some rural water projects are not functioning; interruption of water services longer than a day is relatively frequent in rural areas, and it mainly involves those who have access to communal tap. This presupposes an inefficient system of water delivery to those who need help most, the poor in rural communities and accounts for the disparity in water accessibility between the poor, mostly in rural communities, and the better off, mostly in urban formal areas. However, the level of effectiveness of municipalities in rural areas is less easy to determine. The problem is not so much the high levels of respondents giving 'don't knows' and 'just stopped' as reasons for interruptions, but rather the question of whether repairs, given by the majority of the respondents in rural areas as reason for interruptions, were being conducted efficiently and within reasonable time as set out in the Water Services Regulation.

The evidence from the survey is that the dissatisfaction with government handling of water and sanitation services is highest in the rural areas and lowest in urban informal areas. However, the highest level of dissatisfaction is evident among those who do not have access to piped water. This clearly undermines the attainment of the key constitutional guarantees, policy goals and benchmarks to extend water services to all in South Africa, and marks out the priority for delivery by government.

Although the survey approach permitted the analysis of people's experiences and opinions, these experiences were captured through a snapshot of statistics to form a basis for a cross-sectional analysis; it did not permit an in-depth analysis of the lived experiences of the people, as would, for instance, a case study or a participatory approach, which in addition, allows researchers to probe, interact and discover for themselves the conditions of water service infrastructure and projects. Nonetheless, the analysis provides useful insights into demographic studies that seek to understand the relationship between efficient management of water services and social equity.

Generally attitudes are associated with conditions; conditions affect consciousness. The study observes that since consumer participation provides a means by which consumers' needs and concerns may be articulated and addressed, it is incumbent upon DWAF and local governments to constantly find ingenious ways to encourage participation in the planning and implementation of water projects to improve the quality of life of rural populations. The extent of public participation in water service delivery management, maintenance and operations may be indicated by public representation on water committees/commissions, their role in identifying, reporting

and helping to resolve water service delivery constraints, and the seriousness with which public complaints and suggestions to improve the service are handled.

FROM PROJECTS TO MUNICIPAL SERVICES.....	6
MEASURING DELIVERY.....	7
HOUSEHOLD SIZE AND POVERTY .....	9
THE PERCEPTION OF PROBLEMS.....	10
THE BACKLOG IN WATER SERVICES .....	11
ARE WATER SERVICES WORKING? .....	13
WHY ARE THERE INTERRUPTIONS?.....	16
THE RURAL POOR AND FREE BASIC WATER .....	18
ACCESS TO SANITATION.....	19
TARGETS AND SUSTAINED DELIVERY .....	20
BIBLIOGRAPHY .....	22

The need for high standards of service delivery in South Africa are heightened by the appalling inequalities and poverty – a legacy of apartheid - which affects mainly the African population. The problem of ‘development’, of service provision and poverty alleviation is felt most strongly in the rural areas. In this demographic context, service delivery is an acknowledged route to poverty alleviation and human wellbeing. Yet for just under half the population of South Africa there are the most acute problems of access and sustainable water services. In a recent review, Statistics South Africa reports that the rural population amounts to 19 million, or 42,5% of the population in 2001, and it is to this relatively deprived group that the research associated with this paper is directed (StatsSA. 2003:Table 3.1-1).

The re-arrangements within service delivery place municipal government at the centre; this sphere of government is now responsible for most of the life sustaining services. Although this change has started from well established policy there are concerns that delivery and operational services could be impaired by the transfer. As the White Paper puts it:

Combined with service backlogs, collapsed or deteriorating infrastructure, and deteriorating creditworthiness and borrowing capacity, municipalities are experiencing financial stress, and in some instances crisis (WP, 1998:2.2).

Equitable service delivery through decentralisation is a goal which is proving difficult to achieve. In a wide-ranging evaluation of policy a critic argues:

It is far more important that elected local communities be equipped with the three *performance enablers*,.....They must have adequate resources, adequate powers, plus adequate mechanisms to ensure the accountability of elected representatives to citizens, and the accountability of bureaucrats to elected representatives. In the absence of these performance enablers, elaborate indicators will merely reveal failure (Manor 2001:11).

Critics of conservative economic policies argue that for poor, mostly rural populations, the quality of service is inferior and water and sanitation projects unsustainable. Experienced practitioners in the field have stated that between 50-70% of rural water projects are not operating; a picture is presented of better community-based rural water projects running for two or three years and then failing when the first expensive component fails, for example, an electric motor or a diesel engine (Still, 2001). As a result of uneven delivery rural populations are more vulnerable to diarrhoea and also to virulent water-borne diseases such as cholera.<sup>1</sup>

Such conditions raise problems of social equity, as well as the efficiency and effectiveness of municipal management in the provision of water services. Two issues are of interest, here: the notions of *equity* and *efficiency* in the management of rural water and sanitation service delivery. The former relates to the extent to which water services include the poorest and the free basic water services are being provided; the latter relates to the equally important principle that water services should be operational and not marred by breakdowns and disconnections as is spelt out in the Strategic Framework (DWAF, 2003).

To what extent are the difficulties anticipated in transferring services to rural municipalities being overcome? How are constitutional guarantees being maintained when there are both backlogs and troubled systems of operations and maintenance? We answer these questions by exploring the efficiency of local authorities in managing the operations and maintenance of water and sanitation service delivery, and the link between efficiency and equity.

---

<sup>1</sup> The cholera outbreak in Kwazulu-Natal in 2000/01 was a stark reminder of these problems.

The analysis is largely based on two survey datasets: the Human Sciences Research Council's South African Social Attitudes Survey (SASAS) (HSRC 2003) as well as the General Households Survey (GHS 2002). The authors have had some experience with the survey methods in evaluating service quality, and concluded that attitudes are guides to the quality of services (Hemson and Owusu-Ampomah, 2004).

Although the survey approach permits the analysis of people's experiences and opinions, these experiences are captured through a snapshot of time to form a statistical basis for a cross-sectional analysis. It does not, however, permit an in-depth analysis of the lived experiences of the people, as would, for instance, a case study or a participatory approach, which in addition, allows researchers to probe, interact and discover for themselves the conditions of water service infrastructure and projects. Nonetheless, the survey approach to service quality analysis, which includes a representative sample of households nationally, provides useful insights into demographic concerns seeking to explore the relationship between rural populations and efficient management of water services and social equity.

### **From projects to municipal services**

Municipal managers are responsible for managing impacts, which affect water quality, and economic viability, sustainability and continuity of water services. It is their responsibility to guard against water loss through leakage, wastage and pollution, and service interruptions, keeping a focus on the overall objective of social equity in service delivery. The DWAF Strategic Framework carries the following as a set of foundation principles: water and sanitation services are to be provided:

- Equitably (adequate services are provided fairly to all people);
- Affordably (no one is excluded from access to basic services because of their cost);
- Effectively (the job is done well), and
- Efficiently (resources are not wasted);
- Sustainably (services are financially, environmentally, institutionally and socially sustainable); and
- Gender sensitively (taking into account the different needs and responsibilities of women and men with regard to water services and sanitation) (DWAF, 2003:5).

These are the principles and responsibilities which are regarded as necessary to achieve properly operating services to achieve redistribution. At the same time some commentators regard it uncontested that many municipalities are not providing adequate services in these terms; one indeed writes that there is a 'wildly unrealistic set of tasks imposed upon local authorities' (Manor, 2001:8). Even some of the staunchest defenders of the present policy argue that conservative policies are putting strain on municipalities: "the fiscal squeeze is being felt as harshly at local level, exacerbated by the massive burden of service backlogs, poverty and redistributive needs" (Olver, 1998:289).

While many metropolitan municipalities are accused of being too ready to cut-off residents who are not paying their bills, rural municipalities are characterized as inefficient and ineffective in maintaining services in remote communities (a high project failure rate is variously ascribed in rural communities). Issues of equity also often arise, as inequality generally and income inequality is on the increase despite considerable increase in welfare spending in the past decade.

## Measuring delivery

Public service scholars and technocrats often use the concepts effectiveness and efficiency. The two concepts are distinct but complementary, although the former is often less emphasised. Effectiveness refers to the fulfilment of predetermined goals, i.e., doing what is right or what one sets out to achieve; efficiency is the fulfilment of predetermined goals with *minimum* resources, e.g., financial resources, land, equipment, information, time etc. (Mafunisa, 2003; DWAF 2003:5). In this paper, efficiency is taken largely to estimate whether municipalities are operating and maintaining water services continuously, but the principle of equity is inseparably linked to efficiency in relation to the considerable backlog in delivery.

Equity implies inclusive water service coverage. For those with a service, water and sanitation service provision must not exclude people on the basis of poverty or inability to pay; in this sense, equity is all about sustaining water services to the poor. In this paper equity is measured by looking principally at

access,  
differences levels of service between rural and urban populations, races and classes, and  
the provision of free services.

A municipal water system could be regarded as effective if it is using public funds to meeting the backlog and efficient if it is operating continuously; this is what is commonly regarded as 'working' and 'sustainable' (at least in the medium term). Efficiency may be measured in terms of cost-effectiveness or 'value for money', performance standards, productivity and time taken to accomplish tasks. On the other hand, ways in which effectiveness may be measured include conditions, value orientation and motivation, satisfaction and perceptions, institutional dynamics and impact.<sup>2</sup> Much of this indicator-set is subjective, and this perhaps may have led Fitzgerald (1988) to conclude that "a service...cannot be objectively measured". Although there is the inevitable subjective element, on the other hand it is fairly evident whether water is flowing from taps or not. To sum up, municipalities are efficient if standpipes are not dry or leaking; water is supplied to standpipes or taps in dwelling or on site and equitable and effective if services are being extended and provided free to the poor.

Useful indicators of equity, efficiency and effectiveness relevant in this analysis include those listed in the table below. Some of the indicators are drawn on the basis of the HSRC (2003) survey questions and the sampled households' responses to the questions; others are derived in the course of the analysis.

**Table: Equity, Efficiency and Effectiveness  
Of Service Delivery Indicators**

---

<sup>2</sup>See Mafunisa, J. 2004. "Measuring efficiency and effectiveness in municipalities: Post-1994 South Africa", 2004 HSRC Conference Paper.

Variable	Indicator
Equity	<ul style="list-style-type: none"> <li>• Service delivery, % of households/people accessing water and sanitation services</li> <li>• Size and location of backlog</li> <li>• Income levels and location of backlog</li> <li>• Level of service, % at lower levels of service</li> <li>• Access to free basic water service</li> </ul>
Efficiency	<ul style="list-style-type: none"> <li>• Performance standards as set out in policy guidelines, statutes, e.g. Strategic Framework (2003); Water Services Act, 1997; Municipal Systems Act</li> <li>• 24 hour, 7 days a week operation</li> <li>• Number or percentage of households/people experiencing interruptions</li> <li>• Time taken to repair services</li> <li>• Number or percentage of households/people experiencing cut-offs</li> <li>• Number or percentage of households/people satisfied or dissatisfied with government performance in service delivery.</li> </ul>
Effectiveness	<ul style="list-style-type: none"> <li>• Unit cost of delivery per household</li> <li>• Volume of water delivered</li> <li>• Free Basic Water: 25 litres per person per day, within 200m; 6kl per household per month</li> </ul>

These indicators do help to provide a description of the overall efficiency and effectiveness of municipal water management, as well as the level of equity in water service delivery in rural areas (see Hemson and Owusu-Ampomah, 2004). Not all can be explored here; measuring efficiency and effectiveness of municipalities poses problems. Data is scarce, inconsistent and often unavailable. The engineering data on operations and maintenance is often in doubt even before the difficult issues of balancing cost-recovery with social equity are faced.

In this paper the attitudes nationally were firstly assessed to highlight the points of satisfaction and dissatisfaction with water services. This revealed that rural communities are the most dissatisfied with governments' handling of water services and that dissatisfaction rose with lower levels of service. Secondly an assessment was made of the backlog in services and this was located also in rural communities; a measure both of equity and effectiveness in service management. Thirdly a more extensive examination is made of efficiency in water services (termed operations and maintenance in the language of engineering) which is measured in terms of interruptions, municipal interventions, and in levels of satisfaction.

Finally conclusions are drawn on the functioning of rural municipalities in terms of the broad strategic objectives set out in the DWAF Strategic Framework, in terms of leveraging funds available for free basic water, managing the delivery of rural sanitation, and realising the goals set out to deliver water services to all in the near future.



## Household size and poverty

A number of officials have noted that the increase in households in South Africa at a faster rate than population increases the difficulties of service delivery. The question of household size is important in the urban setting, but bears more decisively on municipal delivery in the rural areas. In rural areas where services are less vigorously supported households tend to be larger, need to consume more water and yet are poorer.

The household size-income pattern indicates unsurprisingly that the largest households within each income category are to be found among rural dwellers and significantly the proportion of these families generally *rises* with rising income in rural areas and *declines* with rising income among urban dwellers. Significantly again the poorest in the urban areas do not have the largest number of very large families within the R0-R500 income category.

**Table: Very large families ( $\geq 7$ ) by urban/rural divide**

Monthly household income before tax	Urban Areas				Rural Areas			
	Family size $\leq 6$ (%)	Family size $\geq 7$ (%)	Total (%)	N	Family size $\leq 6$ (%)	Family size $\geq 7$ (%)	Total (%)	N
R0 - R500	90.6	9.4	100	1,161,073	77.1	22.9	100	1,270,166
R501 - R1500	87.1	12.9	100	1,578,007	75.7	24.3	100	1,552,720
R1501 - R5000	92.9	7.1	100	1,216,169	68.5	31.5	100	406,673
R5001+	93	7	100	1,145,938	87.6	12.4	100	45,048
Refuse to Answer/Don't know	89.2	10.8	100	2,009,647	69.4	30.6	100	516,831
Total	90.2	9.8	100	7,110,834	74.7	25.3	100	3,791,438

In relation to interruptions, the data suggest that a greater proportion of larger households, especially within the lowest income category (R0-R500) in rural areas are more vulnerable to inadequate and inequitable water and sanitation services than larger families in urban areas. By the low level of income it is virtually impossible for this category of families to access safe drinking water and improved sanitation by themselves, unlike the rich larger families of the urban areas.

By the same reasoning, it goes without saying, this category of families, especially the children among them, is also the most vulnerable to water-borne diseases such as diarrhoea. While the rural population as a whole is exposed to the vagaries of inadequate and inequitable water and sanitation services, there is empirical evidence to suggest that the poorest and larger households bear much of the brunt of inaccessibility and non-sustainability of water and sanitation in rural areas. This is where attention is needed most in the quest for "a better life for all".

## The perception of problems

In a number of questions the SASAS survey provides a general indication of points of satisfaction and dissatisfaction across the country. In the table below the perceptions of respondents are presented in relation to government handling of water and sanitation services, across the wide range of environmental milieu.

**Table: Public Perception - Water and Sanitation**

	Urban Formal	Urban Informal	Tribal	Rural Formal	Total
Satisfied	76.9	39.2	32.2	50.7	59.8
Dissatisfied	19.4	56.2	62.9	44.4	36.0
Neither nor/dnk	3.7	4.6	4.9	4.9	4.2
Total	100	100	100	100	100
N					

The high proportion of respondents in tribal areas who are dissatisfied with the government's handling of water and sanitation services in tribal areas, 62.9%, can be compared to the 76.9% who are satisfied in the urban formal milieu.<sup>3</sup> On the whole, however, 59.8% of the respondents in the survey are satisfied with the government's efforts to provide clean drinking water and sanitation; a sizeable majority nationally, although one which also leaves open questions as to the reasons for the 36.0% dissatisfied. At the first level of analysis there is a radical division between urban and rural population.

What are the causes of satisfaction and dissatisfaction? The table below (in which, for convenience, 'dissatisfied' and 'very dissatisfied' are consolidated) provides a cross-tabulation of attitude to government handling of water services by level of service.

**Table Public perception by level of service**

Gov. handling of water and sanitation	Piped tap water in dwelling and on site/yard	Communal/public tap water	Non-piped Water	Total
Satisfied	73.60%	38.50%	12.10%	59.80%
Dissatisfied	23.10%	57.80%	83.80%	36.70%
Neither nor	2.70%	3.20%	1.50%	2.70%
Do not know	0.70%	0.40%	2.70%	0.80%
Total	100.00%	100.00%	100.00%	100.00%
		2,281,758	987,142	10,198,814

<sup>3</sup> The original draft of this chapter had an extensive analysis of this issue but, due to reasons of space and the need to focus closely and extensively on the question of cut-offs, has unfortunately been excluded from this chapter.

It is clear that the highest levels of satisfaction are recorded by those with the highest level of service, including 73.60% of those with piped water in the dwelling or on site. For those accessing communal taps there is a majority, 57.80%, which is dissatisfied, and for those who still await the benefit of piped water there is an overwhelming majority, 83.80%, which, unsurprisingly, is dissatisfied. Again the urban/rural divide is evident, even though it is partially disguised: the urban population has a level of service overwhelmingly either at the level of domestic or on site connection. Level of service overlays and reinforces the fundamental divide.

What this exploration makes clear is that perceptions are linked to conditions; particularly of levels of service and those of the urban/rural divide. In another article (Hemson and Owusu-Ampomah, 2004) the question of interruptions is widely explored, and again dissatisfaction is (unsurprisingly) connected to a greater frequency of interruptions.

### The backlog in water services

It is noted that the highest level of dissatisfaction with government water service is located among those who have no access. The question of equity is primarily related to whether citizens can have access to clean water as guaranteed by the Constitution. This question will not be examined here in depth as it is exhaustively covered in the other research undertaken by one of the authors (Hemson, 2003). In that research report the provision of adequate financial resources is isolated as the key factor hindering the clearing of the backlog of water and sanitation services; in comparison to national accounts and gross domestic product the amounts necessary to beat the backlog are not large and expenditure to date has been relatively modest. The increasing South African population has constantly added to the numbers in the backlog, but it is also becoming increasingly argued that the proper functioning of municipalities is the most critical to beating the backlog. The point is made forcefully by treasury officials that, even if the funds were available, there is not sufficient capacity to deal with the decisive increases necessary to meet targets of water services (both water access and sanitation) by the targetted years: 2008 and 2010 respectively.

In 1994 there was a backlog of 12 million people to services at the level of the RDP; piped water within 200m. According to the SASAS data, today 5,7 million people remain to gain access to some level of infrastructure and 9.1 million as a whole (including the 5.7 million) require upgrading to basic levels (formerly termed RDP standard). The table below those without access to clean water are selected and located geographically and in terms of household income.

**Table Location and incomes of the backlog**

Environmental Milieu	R0 - R500	R501 - R1500	R1501 - R5000	R5001+	Refuse/ Don't know	Total
Urban Dwellers	3.80%	3.50%	1.00%	0.10%	2.50%	10.80%
Rural Dwellers	35.10%	38.30%	9.10%	0.30%	6.50%	89.20%
Total	38.80%	41.70%	10.10%	0.40%	9.00%	100.00%

The people of the backlog are overwhelmingly (89,2%) rural dwellers and concentrated in the two lowest income categories (73.3%); in short the poorest of rural people. Significantly those with a middle and higher range of income are not in the backlog; if they are located in rural areas they will have made some provision for their households.

An analysis of the SASAS data lends credence to what observers have termed water project failures in rural areas and the inaccessibility of potable water to a number of rural populations. In comparison to urban dwellers the table below shows that 28.8% of the rural population in the survey do not have access to piped water. On the contrary all but 1.8% of urban dwellers have access.

**Table Rural-Urban Access to Piped Water**

Access to Water	Urban Dwellers (%)	Rural Dwellers (%)	Total (%)
Piped Water	98.2	71.2	88.9
Unpiped Water	1.8	28.8	11.1
Total	100.0	100.0	100.0
N	6,744,039	3,551,873	10,295,912

The distribution, nonetheless, is also skewed in terms of the levels of service. Over 86% of urban dwellers either have domestic (62.3%) or on site (25%) water connection; on the contrary only 28.8% of the respondent-households in rural areas have either domestic (9.8%) or on site (19.0) connection; the rest are either accessing water via communal taps (42%) or unpiped sources (28.8%).

**Table: Rural-Urban Levels of Water Service**

Level of Service	Urban Dwellers	Rural Dwellers	Total
Domestic	61.3	9.8	43.5
On site	25.0	19.0	22.9
Communal	11.9	42.4	22.4
Unpiped	1.8	28.8	11.1
Total	100.0	100.0	100.0
N	6,744,039	3,551,872	10,295,911

Major differences also exist in access to water services by race and class, with significant overlapping implications for rural populations. Rural communities are predominantly populated by Africans who are generally poor, and located at the lower rung of the class structure (even if obfuscated in the African context). Long-term change is less dramatic than it would seem: in 1995 the October Household Survey (StatSA 1995) found 59% of African people accessing water in the dwelling or on site; in the HSRC's survey of 2003 this is 61%. Similarly in 1995 42% of African people had access to flush toilets in their dwelling or on site, in 2003 this is 44.2%.

In the HSRC (2003) survey almost all whites (99.4%) and Indians (99.7%) have access to a level of service above the basic level with access to piped tap water in dwelling. Of the respondents in the survey, 90.6% of Coloureds access water services above the basic level compared to 58% of Africans/Blacks. The remainder of African households, mostly in rural areas, is at lower levels of service, basic and below basic levels of service, (18.4% and 9% respectively) and unpiped access (13.8%).

Again there is an overlay between backlog and rural communities; rural dwellers are also those with lower levels of service and who have yet to achieve water taps into their homes. It is within this group that dissatisfaction is most evident. If they have a lower level of service, to what extent is this inferior in terms of management?

### Are water services working?

The majority of rural people have access to clean water; this is the considerable achievement of the post-apartheid period. Unfortunately their access is at the lower level of service, usually through communal taps some distance from their homesteads, and (from the evidence now presented) often providing an irregular supply and, as has been established above, where the levels of satisfaction are lowest.

The Strategic Framework sets out full responsibility for the continuing operation of services on municipalities which are defined in the Water Services Act of 1997 as the water services authority:

The water services authority is ultimately responsible to ensure that the provision of water services is financially sustainable (enabling the ongoing operation of services and adequate maintenance and rehabilitation of assets) (DWAF, 2003:4.3).

A key indicator of an operating (or 'working') water service is that of interruptions. Interruptions negate the principles of operation, maintenance, sustainability, efficiency and effectiveness of service delivery as set out in the Strategic Framework of Water Service (DWAF 2003). Interruptions also impair the ability of municipal managers to efficiently fulfil their mandates in water service delivery, and negate the benchmarks and goals set in statute and regulation. Regulations in terms of the Water Services Act, in part, seeks to achieve efficiency in that no one is without water for more than seven full days in any year.<sup>4</sup> To what extent is this standard being reached?

In this paper the incidence and frequency of interruptions, the reasons for their occurrence, and the time taken to rectify them are examined as the criterion of efficiency. These standards, in turn are, significantly determined by financial and managerial capacity, technological competency, and availability and quality of material resources.

In the table below the data on the frequency of interruptions longer than a day are presented. The highest levels of trouble-free services are reported from rural formal (farm) and urban formal milieus; the most problematic services are in the 'tribal' or rural informal milieu. In the table a third of households reported interruptions 'several times' and 5.6% (4.4% +1.2%) the extraordinary level of at least once a month or more.

**Table: Interruptions longer than a day, environmental milieu**

Number of Interruptions	Urban formal	Urban informal	Rural	Rural formal	Total
Never	70.3	53.5	46.7	81.7	63.1

<sup>4</sup> Reg 3, (b); cited in Joubert, Faris, and Harms, 2002: 315.

Once or twice	15.5	23.8	12.5	7.1	14.9
Several times	10.0	18.6	33.3	6.9	16.9
At least once a month	0.7	1.1	4.4	0.3	1.7
At least once a week	0.1	0.6	1.2	0.1	0.5
Uncertain/do not know	3.4	2.4	1.8	3.8	2.9
Total	100.0	100.0	100.0	100.0	100.0

Interruptions are least evident in the urban areas, where 72.5% of households report no interruptions no longer than a day, and most evident in rural areas where only 27.5% report under this heading. Of those reporting several interruptions for longer than a day 59% is in the rural areas.

**Table Experience of interruptions longer than a day**

	Urban Dwellers	Rural Dwellers	Total	N
Never	72.50%	27.50%	100.00%	6,386,497.00
Sometimes	73.90%	26.10%	100.00%	1,535,462.00
Several	41.00%	59.00%	100.00%	2,059,054.00
Total	66.20%	33.80%	100.00%	9,981,013.00

In the subsequent analysis there is an attempt to get to the heart of the matter by selecting tribal areas within rural populations to get an idea of levels of service management. The most severe interruptions are found among those living in tribal areas; in the Limpopo province 58% of people and in Mpumalanga 48% reported being interrupted for longer than a day several times a year. The least interruptions were reported in KwaZulu-Natal.

**Table Severity of interruptions in tribal areas, longer than a day**

Province	Never (%)	Sometimes (%)	Several (%)	Total (%)	N
LP	31	11	58	100	820,402
EC	40	20	40	100	787,248
MP	41	10	48	100	252,614
FS	50	15	35	100	66,110
NW	53	6	41	100	349,740
KZN	71	10	20	100	507,770

To what extent are higher levels of service free of these problems? Curiously those with domestic connections (a small minority in rural areas) report the highest number of interruptions 'often', followed by those accessing communal taps who have a somewhat lower level of interruptions. Despite this, more than 50% report experience of interruptions 'often'. This marks a very strong contrast with the levels of service experienced in the formal urban areas.

The province with the most proportion of respondents reporting repairs being undertaken the 'same day' is ranked 1; the least, ranked 9. Finally, interruptions are ranked from most to least: the province with the highest proportion of respondents reporting 'interruptions, several' is ranked 9, and the least, 1.

**Table: Repairs and interruptions by rank**

	Repairs, Same Day		Interruptions, Several	
	(%)	Rank	(%)	Rank
WC	74.7	1	13.6	1
GT	68.0	2	17.2	2
KZN	61.0	3	20.0	4
NC	50.0	4	18.7	3
FS	46.2	5	29.4	5
MP	40.4	6	40.2	8
NW	38.5	7	36.0	7
EC	34.5	8	31.5	6
LP	24.0	9	59.5	9

In general, interruptions, as should be expected, positively correlates with dissatisfaction: the more a province experiences interruptions the greater the proportion of respondents that is likely to report dissatisfied. Conversely, the lesser a province experiences interruptions the lesser the proportion of respondents reporting dissatisfied with the government's handling of water services.

To take the analysis further: the data on repairs suggest that time taken to repair services negatively correlates with dissatisfaction; high-ranked provinces on repairs are less likely to be dissatisfied with the government's handling of water and sanitation services, low-ranking provinces on repairs, same day, are more likely to be dissatisfied.

There is also a negative relationship between repairs and interruptions. In other words, provinces ranked high on repairs i.e. experiencing most repair-interventions, tend to be ranked the least on interruptions or report less interruptions, and therefore are less likely to be dissatisfied; provinces ranked low on repairs tend to be ranked high on interruptions and therefore are relatively more likely to be dissatisfied with the government's handling of water and sanitation services. In sum consumers are more likely to be satisfied with the government's handling of water and sanitation services when repairs are promptly attended to and interruptions are few or non-existent, and this is an issue of efficiency in water and sanitation management.

These are general trends even if the relationships are not strong or always clear-cut in specific cases. Limpopo and Western Cape are clear cases true to the axioms, while the case of Kwazulu-Natal is a puzzle. Although it is reasonably ranked on interruptions and time taken to effect repairs it is the province with the highest proportion of respondents reporting dissatisfied with the government's handling of water and sanitation. The high level of dissatisfaction is obviously explained by factors other than interruptions and delay in repair-interventions; one of them is

cut-off for non-payment of water services.<sup>5</sup> Calculations from the SASAS database shows that the highest number of cut-offs was reported in KwaZulu-Natal in 2002, followed by the Free State, and the lowest in the Western Cape (Hemson and Owuwu-Ampomah, 2004).

Whatever the reason for the high level of dissatisfaction in Kwazulu-Natal dissatisfaction still remains an issue of significant managerial and political proportions, just as in Limpopo, Eastern Cape and North West where the managerial problem principally takes the form of interruptions and municipal repair interventions. Clearly in these provinces, where rural populations are very large, the water systems are not functioning, as they should be.

### **Why are there interruptions?**

The reasons for the high level of dissatisfaction of the government's performance in water and sanitation provision are helpful in identifying the nature of delivery problems and interventions needed. The HSRC survey (HSRC 2003) and the GHS (2002) do not carry questions to provide data for reasons why respondents reported either satisfied or dissatisfied with the government's performance but there are data on reasons for cut-offs and interruptions of water and sanitation service which can serve as a proxy. Even then, reasons can be imputed, and this was found necessary in this paper, in some instances. The GHS (2002) significantly complements this with data on perceptions of water quality, which also explain the satisfaction or dissatisfaction of the subjects in the survey.

In the table below over a third (38.9%) of the respondents in the HSRC survey (HSRC 2003) who have access to piped tap water cited 'interruption for repairs' as the main reason for water service interruptions. As argued elsewhere, these may indicate active municipal intervention to improve services but 'burst pipes' and 'pump not working', given as reasons for interruptions in the GHS (2002) data, do indicate sources of dissatisfaction, as well as a range of issues for which municipalities must be held accountable.

**Table: Reasons for interruptions, past year in rural areas**

---

<sup>5</sup> The cut-off for non-payment phenomenon has been discussed in detail elsewhere (see Hemson and Owusu-Ampomah, forthcoming). It may, therefore, suffice just to refer to the table below in our attempt to explain the anomalous situation of Kwazulu-Natal.



<b>Main Reason</b>	<b>GHS 2002</b>	<b>HSRC 2004</b>
Bust Pipes	37.2	0
Pump Not Working	9.1	0
General Maintenance/Interrupted for repairs	28.6	38.9
Not enough water in the system (Demand too high)*	11.9	1.4
Water only delivered at fixed times **	1.6	2.8
Cut-off for non-payment of services	3	7.5
Vandalism	1.4	0
Drought	0	5.3
Other, specify	0.9	4.7
Just stopped/Don't know	6.3	39.3
Total	100	100
N	22,183	3,702,734

\*Corresponding category in HSRC survey (2003) is 'Others use too much water, left none'.

\*\* Corresponding category in HSRC survey (2003) is 'Water being sent to other communities'.

Source: Hemson and Owusu-Ampomah, (2004), (Modified to reflect new weighting of households)

In rural communities, routine or necessary 'repairs' to communal tap water systems or upgrading of service has the effect of temporary water inaccessibility, but this would be lauded as an indication of efficient management. Natural wear and tear of equipment may not raise any hue and cry; damage to pipes, as a result of construction works, and vandalism may not render municipalities answerable. However, for other reasons such as the use of inferior materials, resulting in rampant breakdowns, and inadequate finance and lack of managerial capacity and technical know-how, the efficiency of municipalities may become a subject for debate.

Responses on the cutoff question as a reason for interruptions in the HSRC survey show that the cut-off for non-payment is largely an urban phenomenon. It affects mostly the poor, and the hitherto disadvantaged Africans, some of whom have just moved up the 'water ladder' in the democratic transition.

Households in rural and informal urban settlements were the least affected by cut-offs for non-payment, as they do not have domestic connections. They were also the households most likely not to know the reasons for supply interruptions.<sup>6</sup>

Perceptions of water quality are also a significant source of dissatisfaction, and hence a fairly good measure of municipal efficiency in water service delivery, particularly among rural populations. In the recent GHS survey (GHS 2002) there were decided opinions expressed about the safety of water; and a sharp divide in attitude between households accessing piped water which is generally seen as safe and better tasting and those accessing unpiped sources which are generally seen as unsafe and untreated.

<sup>6</sup> For detailed analyses of the controversial cutoff issue see McDonald, 2002 and Hemson and Owusu-Ampomah (forthcoming).

## The rural poor and free basic water

Since October 2002 the government has been providing water free of charge to all households, but particularly poor households that cannot afford to pay for it. The policy allows households to receive up to 6kl of water per month. Not only is this in the spirit of equity and the fulfilment of a constitutional obligation. Access to safe water also provides health benefits, including freedom from water-borne diseases and low child mortality rate.

To what extent have rural communities benefited from the free basic water service? Generally, the provision of free basic water in rural communities has led to consumption rising to and/or above the first phase of RDP standard, i.e., 25l per person per day. However, the policy has not principally targeted rural households, which invariably need basic services most desperately but are least capable of paying for them. Most rural communities still do not benefit from the free basic water service although it is here that the need is greatest.

The free basic water policy, properly and fully implemented, to provide 6000 litres particularly to rural households would bring a substantial improvement in current consumption and probably considerable health benefits. Unfortunately the matter is not quite so simple. In the table below the statistics are presented from municipalities of the numbers benefitting and the numbers of poor benefitting.

**Table Beneficiaries of free basic water**

Province	Total no. benefitting	Poor, percent
Eastern Cape	2,838,562	78.2
Northern Cape	594,682	67.7
Free State	2,845,595	63.3
KwaZulu-Natal	5,820,107	61.8
North West	2,361,338	47.9
Gauteng	8,007,114	44.1
Western Cape	3,918,376	36.5
Limpopo	2,792,139	31.8
Mpumalanga	1,441,094	20.5
	30,619,007	50.0

The statistics indicate a weak form of equity intervention. Altogether a total of 30,6m out of South Africa's 46m are benefitting from the free basic water policy. However, although the poorest have been targetted to benefit from free basic water only 50% of the poor (that is households with an income below R1000 a month) or 15 million people acutally benefit. This is partially because the poorest are still among those who have yet to have access to piped water (some 10 million people), but also because those poor households in the rural areas have yet to be included in the program. More than 3 years after the policy has been launched in the midst of the

cholera epidemic there are still substantial difficulties in getting the benefits of pro-poor policy to poor rural people. Unfortunately the difficulties are most pronounced in the 'rural' and poor provinces of Mpumalanga and Limpopo where only 20.5% and 31.8% of poor people respectively are benefitting from free basic water. Similar instances are to be found among the more remote district councils of KwaZulu-Natal.

As a rule rather than an exception, revenue received from beneficiaries has generally not been adequate to maintain water facilities in essential maintenance. Problems of sustainability continue in the management of projects on standalone basis, and there are shorter or longer breakdowns in service in many projects (Hemson, 2003:6).

The problem has been that although the infrastructure has been provided, most people cannot afford to pay for the service, due primarily to unemployment and low-income levels in rural areas. In some cases, dry standpipes and/or interruptions in water service delivery, long distance of households from standpipes, and restrictions on water use (e.g. preventing people from using water for things like washing blankets and irrigation of vegetable farms), have been disincentive to contributing toward the maintenance of the system.<sup>7</sup> It has also not been possible to enforce laws and regulations on nonpayment in rural communities; often defaulters escape the long arms of the law as a result of kinship and the network of close-knit social relationships in these communities. Anti-social behaviours such as vandalism (supported by GHS (2002) data) and theft also contribute to the difficulties of municipal water management and the poor service quality in some rural communities (Ntshona and Lahiff, 2003).

### Access to sanitation

The sanitation problem is most acute in rural areas. Improved sanitation includes flush toilets and VIPs (Ventilated Improved Privies); unimproved comprises chemical toilet, pit latrine without ventilation, bucket toilet and others. In rural areas only 15.6% has access to improved toilet. In contrast 83.1 % of urban dwellers have access to improved sanitation.

**Table: Rural-Urban Access to Sanitation**

Toilet Type	Urban Dwellers (%)	Rural Dwellers (%)	Total (%)
Improved Toilet	83.1	15.6	59.7
Unimproved Toilet	15.3	67.3	33.3
None	1.6	17.2	7.0
Total (%)	100.0	100.0	100.0
N	7,244,396	3,848,856	11,093,252

In rural areas, only 8.2% access flush toilets and 7.4%, VIPs. Of the remainder 63.0% use unimproved pit latrines and 17.2% have none. In urban areas there is a marked contrast: 81.4% has access to flush toilets and 11.7%, VIPs

There is a considerable backlog in sanitation of 4,47 million households including 19,8 million people and progress has been slow. This backlog is concentrated in the 'rural' provinces of KwaZulu-Natal, Limpopo and the Eastern Cape.

<sup>7</sup> In the case of restrictions on water use, non-contribution would clearly be an unintended consequence.

**Table Backlog in improved sanitation by households**

Province	Household	Percent
KZN	906,765	20.3
LP	899,289	20.1
EC	855,076	19.1
GT	536,643	12.0
NW	531,598	11.9
MP	397,552	8.9
FS	219,764	4.9
WC	72,775	1.6
NC	52,193	1.2
Total	4,471,656	100

### Targets and sustained delivery

The sustainability of water services delivery in rural areas is a test of the government's promise to provide a "better life for all", and from international experience, this depends on several factors. The greatest threat to achieving this goal, perhaps, is the backlog, in tandem with severe interruptions of water service delivery; the key mediating-factor is efficient rural water management but community participation is critical.

The analysis in this paper shows that there are managerial difficulties in ensuring the sustainability of rural water services and infrastructure. At all levels of analysis of the HSRC (2003) survey data – geography, race and class – there is evidence that rural water services, at least in some municipalities, are not functioning adequately although some municipalities may claim efficient water service delivery and management. Interruption of water services longer than a day is relatively frequent, and these problems mainly involve those who have access to communal taps. This is firm evidence of inefficiencies in water service delivery to those who need help most, the poor in rural communities. This largely accounts for the disparity in water accessibility between the poor, mostly in rural communities, and the better off, mostly in urban formal areas.

The evidence from the survey is that generally households that experience high level interruptions of water service delivery are dissatisfied. This confirms the views that not only are attitudes associated with conditions; conditions also affect consciousness. The dissatisfaction with government handling of water and sanitation services is highest in the rural areas and lowest in urban areas. However, the highest level of dissatisfaction is most evident among those who do not have access to piped water. This clearly undermines the attainment of the key constitutional guarantees, policy goals and benchmarks to extend water services to all in South Africa equitably.

Clearly, there is a link between equity and efficiency in water service delivery and management. The relationship is a positive one, which may be expressed axiomatically as follows: the higher the level of efficiency in water management, the greater will be the level of equity in water service delivery, *ceteris paribus*. Severe interruptions of water service have the effect of rolling back efforts towards meeting current needs or demand and inflating the backlog. The cumulative effect

tends to stretch the intractability of the backlog, and the difficulty of meeting expectations of equity in terms of geography, race and class.

Can water and sanitation service be sustained, then, in a situation of severe interruptions and a backlog of water and sanitation services? Where are the problems located?

In South Africa containing the broader strategic constraints, above, is a prerequisite, but motivating technocrats and local communities to embrace a participatory approach to service delivery is critical. The involvement of communities is at two levels: first, participation in decision-making, and secondly, patronage of water and sanitation projects, and here improvement in employment and incomes, and citizenship development are vital. For efficiency and effectiveness, financial injection alone is not sufficient although it is critical; dedication and incentives are essential catalysts to performance.

## Bibliography

- Didomenico, E & Bonnici, J 1996. 'Assessing service quality within the educational environment', in *Education*, vol. 116, no. 3, Spring, pp. 353-359.
- Fitzgerald, T. 1988. "Understanding the Differences Between Services and Products to Exploit Your Competitive Advantage". *Journal of Services Marketing*, 2(1), 25-30.
- Hemson, D. and K. Owusu-Ampomah (Forthcoming) "A better life for all? Service delivery and poverty alleviation in South Africa. In J. Daniel, A. Habib, R. Southall (ed). *State of the Nation 2*, HSRC, Pretoria.
- Hemson, D. and K. Owusu-Ampomah (2004) "The 'vexed question': cut-offs and water service management in South Africa". In Benjamin Roberts and S. Rule. HSRC, 2004. "South African Social Attitudes Survey (SASAS): Data Documentation", Human Sciences research Council (HSRC), Pretoria.
- Hemson, David. January 2004. Beating the backlog: meeting targets and providing free basic services. HSRC, Durban.
- Joubert, W.A., J. A. Faris, and Harms, The Hon L. C. T. 2002. "The Water Services Act", *The Law of South Africa*, First Reissue, Vol 30.
- Kasrils, R. 2000. "Water Conservation and Water Demand Management Strategy". Address by the Minister of Water Affairs and Forestry at the launch of the Midrand Water Conservation and Water Demand Management Strategy Council Chambers, Midrand, 17 March, 2000. <http://www.gov.za>.
- Mafunisa, M.J. 2004. Measuring efficiency and effectiveness in local government in South Africa, *Journal of Public Administration*. (39) 2: pp 290-301.
- Manor, J. 2001. "Local Government in South Africa: Potential Disaster Despite Genuine Promise," IDS, Sussex.
- McDonald, D. 2002. "The Bell Toll for Thee: Cost Recovery, Cutoffs, and Affordability of Municipal Services in South Africa". In David A. McDonald and John Pape (eds.) *Cost Recovery and the Crisis of Service Delivery in South Africa*, London: HSRC Publishers and Zed Books.
- Mackintosh, Grant and Christine Colvin May 2003 Failure of rural schemes in South Africa to provide potable water. *Environmental Geology*. 44(1): 101 – 105.
- Ntshona, Z. and E. Lahiff 2003. "Rural Development, Institutional Change and Livelihoods in the Eastern Cape, South Africa: A Case of Mdudwa Village, Research Paper 5, IDS, Sussex.
- Republic of South Africa 1997. "Water Services Act 108" <http://www-dwaf.pwv.gov.za/Documents/Legislature/wsa97.PDF>
- Republic of South Africa 1998. "National Water Act", 1998. [http://www.acts.co.za/ntl\\_water/index.htm](http://www.acts.co.za/ntl_water/index.htm)
- Republic of South Africa 2001. "Municipal Systems Act", Pretoria.
- Republic of South Africa 2003. "Towards A Ten Year Review: Synthesis Report on Implementation of Government Programmes – A Discussion Document". Policy Co-ordination and Advisory Services (PCAS), The Presidency, Government Communications (GCIS) Pretoria.
- Republic of South Africa. 9 March 1998. The White Paper on Local Government. Department of Provincial and Local Government.
- Republic South Africa 2003. "Strategic Framework for Water Services", Department of water Affairs and Forestry, Pretoria.
- StatisticsSA 1995. *October Household Survey*, Statistics South Africa, Pretoria. <http://www.statsa.gov.za>
- Statistics South Africa 2002. *General Household Survey*, Stats SA, Pretoria [www.statsa.gov.za](http://www.statsa.gov.za)

- StatsSA. 2003. Census 2001: Investigation into appropriate definitions of urban and rural areas for South Africa: Discussion document. Statistics South Africa. Pretoria: Statistics South Africa. [Report No. 03-02-20 (2001)]
- Still, David. 2001. Free basic water in rural areas: is it feasible? A Perspective from KwaZulu-Natal. Paper presented at SAICE Congress, 3 July 2001, George.
- van Wijk-Sijbesma, C. 2001. *The Best of Two Worlds?: Methodology for Participatory Assessment of Community Water Services*, IRC Technical Paper series 38, IRC International Water and Sanitation Centre, Delft, The Netherlands.
- Wellman, Peter. 9 May 1999. Sustainability of SA's 'water miracle' questioned. *Sunday World*
- World Bank 1999. "Benchmarking Water & Sanitation Utilities: A Start-Up Kit". Transport, Water and Urban Development Department: Water & Sanitation Division, Washington D.C. <http://www.worldbank.org/watsan/pdf/benchmarking.pdf>
- Yepes, G. 2001. Regulation of Water Supply and Sanitation Services: A Review on Selected Countries in Latin America. [www.ehproject.org/PDF/StrategicPapers/LACDEC/Regulation.pdf](http://www.ehproject.org/PDF/StrategicPapers/LACDEC/Regulation.pdf)