Public health and the quality of drinking water in rural communities in South Africa: issues arising from the cholera epidemic 2000/01

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Water quality is an issue of increasing importance; in South Africa deaths from diarrheal diseases continue to be reported and outbreaks of other water related diseases occur. The most recent cholera epidemic was one of the largest in terms of incidence in recent history internationally although there was a low fatality rate. The epidemic has had a significant effect on public policy with the acceleration of delivery particularly in sanitation and has also heightened a concern for safe water.

Safe water at point of use is crucial to the lowering the rates of morbidity and mortality from diarrheal diseases and in dealing with populations with low levels of immunity. Diarrheal diseases are one of the key symptoms of HIV/AIDS and appear to be linked to unsafe drinking water for those who are immuno-deficient. These issues appear not to be receiving adequate attention in South Africa.

Water quality in rural communities is acknowledged to be poorly managed and is often below minimum standards. The issue of safe drinking water is of increasing concern in rural communities.

The objective of this paper is to discuss management of safe drinking water in the rural community context and to analyse perceptions of water quality among rural populations. The technical processes and results of testing water quality are often viewed as a 'mysterious alchemy' and a 'closed book' by ordinary citizens and municipal managers. There are, however, decided views of quality by those who consume water. To what extent is perception and measurement of water quality related?

The question of water quality can be viewed in three contexts: firstly large sections of the rural population do not have access to piped water. There is little or no surveillance of the quality of water in rivers and streams and rural people drawing from these sourceds are at risk. Among those populations with access to piped water there is also concern that there should be consistent access to safe drinking water. There are two concerns here; firstly to ensure that rural water services are operating efficiently and short breakdown time and quick repairs, and the secondly the quality of water is within the specified standards. The third level of concern is with the quality of water in stored containers, at the point-of-use.

In this paper a brief survey of current literature is made with particular emphasis on the increasing concern about actual quality of water consumed at point of use. It is increasingly clear that access to piped drinking water at source does not necessarily mean that there is safe drinking water at point of use. This is most apparent at the lowest levels of service. It is concluded that water quality in rural communities is often unsafe at improved and unimproved sources and certainly at the point of use.

Problems in the quality of water are identified as particularly affecting closer settlements in peri-urban and rural communities. These are most vulnerable as there are relatively low levels of sanitation and high risk drinking water being contaminated by *e coli* and other pathogens. In addition there are problems of poorly functioning water systems which have two consequences: a return to unsafe water conditions and a worsening of the quality of piped water.

Household surveys contain question relating to perceptions of water quality; this data is analyed and related these to studies of the quality of water in rural communities. Surveys question citizens as consumers about the quality of water combines issues of taste, turbidity, and safety. Although the rank of concern about each criterion changes from one level of service to another, opinion

tends to associate these various issues closely together. There are very large differences in perception of water quality according to the level of service; those enjoying direct domestic connection having the highest levels of satisfaction and those drawing from rivers and streams with the highest levels of dissatisfaction. The levels of dissatisfaction with water quality are extraordinarily high among those who either draw water from rivers or who are at the lowest level of service. It is from these sources that water quality, as measured scientifically, is also concluded to be questionable.

In addition negative perceptions about the taste of water are commonly known to drive populations from using 'improved' water sources to accessing 'unimproved' and potentially unsafe water.

The paper puts forward recommendations about improving the flow of information between various agencies involved both in water quality assessment and public health. It is argued there should be a higher level of coordination between departments and spheres of government. A high level of communication and participation is essential to ensure some reciprocity between public opinion and perception of water quality and the agencies involved in ensuring public health.

Water quality is an issue of increasing importance; in South Africa deaths from diarrheal diseases continue to be reported and outbreaks of other water related diseases occur. The most recent cholera epidemic was one of the largest in terms of incidence in recent history internationally although there was a low fatality rate. The question raised important questions about the origin of the outbreak and the testing of quality of water. One of the requirements of the Water Services Act of 1997 is that municipalities should be responsible for the quality of water and enforcing by laws which set out standards. There is not, however, regular testing of water quality in rural water services.

Diarrhea and cholera are diseases largely resulting from the absence of sanitation and deprivation. They can be eradicated by fairly elementary public health measures such as provision of sanitation, clean drinking water and encouragement of hand washing. Reports of outbreaks to the WHO show that cholera, which was previously widespread in the former colonial regions generally is increasingly limited to the African continent. South Africa is one of the most developed states in Africa with a higher level of service delivery in rural communities and the incidence of cholera was something of a surprise. In the post-apartheid period has given priority to the delivery of water and sanitation to rural areas, was subject to a substantial outbreak of cholera in the period 2000-01. An outbreak in August 2000 in KwaZulu-Natal Province, gave rise to more than 114 000 cases by its conclusion. According to WHO statistics this was the biggest outbreak in Africa and internationally for that period, all in all, the South African outbreak accounted for 80 percent of all cases worldwide in the reporting period.

In the post liberation period cholera is associated with colonial experiences and impoverished countries and not with governments not well attuned to the needs of the rural people. The epidemic has had a significant effect on public policy with the acceleration of delivery particularly in sanitation and has also heightened a concern for safe water particularly to the rural poor. The question is whether this concern has been carried over into improved health interventions and better and more reliable water services. The argument is made here that it has not.

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Obligations of law

Legislation in South Africa does carry provision for the regulation of water quality. The Water Services Act, No 108 of 1997, includes provision for quality in the definition of the basic service:

> "basic water supply" means the prescribed minimum standard of water supply services necessary for the reliable supply of a sufficient quantity and quality of water to households, including informal households, to support life and personal hygiene. (WSA, S1,iii)

Significantly the quantity of water is related to quality, and specific mention is made to informal households (or inferior housing in slums, in the language of the MDG); what is not specified is the standards and measurement of both quantity and quality. The former is governed in part by the definition of a basic service in the Strategical Framework for the Water Sector as access within 200m to a communal tap to provide 25 litres per person per day. The Act does, however, require that the Water Service Authority (in the Act this is *ipso facto* the municipality) make bylaws for the following:

> Every water services authority must make bylaws which contain conditions for the provision of water services, and which must provide for at least— (a) the standard of the services; (b) the technical conditions of supply. including quality standards (WSA, S21, 1).

Few Water Service Authorities appear to have undertaken this obligation. The eThekwini Metro which is regarded as a model local authoirty in its management of water services which have been amended this year provides the following *exclusion* of rights as follows in its General Conditions of Supply:

> The granting of a supply of water by the Council shall not constitute an undertaking by it to maintain at any time or at any point in its water supply system -(a) an uninterrupted supply;(b) a specific pressure or rate of flow in such supply; or(c) a specific standard of quality of such water. Ethwenini Water bylaws, II.10 (1).

It seems that the main priority of municipalities is to limit its liability in providing a service rather than spelling out responsibilities and confirming citizen rights in terms of the Constitution, local government legislation, and water statutes. The existing bylaw spells out the responsibilities of those given permission to draw alternative water supplies on their own account to meet the specifications of SABS 241-1971 in terms of water quality, but does not set these standards for the municipality itself. Specifically it appears that even well-established municipalities with international reputations are not enacting water bylaws as required in the Water Service Act.

The policy of DWAF acting as the water regulator is not to view the lack of compliance with national legislation as a matter for 'naming and shaming', the strategy set out in the Strategic Framework for Water Services, but rather to encourage municipalities to start monitoring water quality and generally raise the quality of water over time (Mckintosh etal, 2004).

Strategies for improvement in water quality

This paper deals with some complexities of monitoring water quality particularly in rural communities in South Africa in the context of the requirements of law and the international standards and policy advice provided by the World Health Organization.

The approach of the World Health Organization is to move away from using monitoring instruments to pronounce on the safety of water as positive or negative but to encourage the use of results in a manner of improving risk management.

> End-product testing comes too late to ensure safe drinking water, owing to the nature of current microbial sampling and testing, which typically provides results only after water has been distributed and often consumed.

Thus, this document gives guidance on the appropriate application of monitoring parameters for ensuring the safety of drinking water and to inform risk management decisions, with an emphasis on control of faecal contamination. It offers guidance on how to select and use multiple parameters to meet specific information needs as a support to safe practice throughout the whole water system: catchment protection and assessment, source water quality assessment, assessment of treatment efficiency, monitoring the quality of drinking water leaving the treatment facility and in the distribution system. It offers a comprehensive review of traditional index and indicator organisms and of emerging technologies. WHO, 1993

This appears to be a reasonable and systematic approach; the difficulty is how to operate where there is little tradition of monitoring and improvement as in the case of many urban and virtually all rural services. The question raised important questions about the origin of the outbreak and the testing of quality of water. One of the requirements of the Water Services Act of 1997 is that municipalities should be responsible for the quality of water and enforcing by laws which set out standards. There is not, however, regular testing of water quality in rural water services.

> An essential component of managing water resources and the environment is that of monitoring and analysis of samples taken from the environment. Without the chemical and microbiological analysis of water samples, it would not be possible to determine the status and safety of drinking water supplies, which are so essential a requirement for the well-being of communities, and the sustenance of life. (WRC, 2001).

The broad question is why South Africa, which is conducting a program of accelerated community water and environmental sanitation delivery should experience such a setback forcing diversion of resources from water delivery and from AIDS intervention to elementary public health issues.

The level of service and quality issues

This guide is specifically aimed at explaining the concepts related to the laboratory analytical techniques. These techniques are often viewed as mysterious alchemy and a closed book by non-technical experts and managers alike. By attempting to explain some of the more basic concepts of analytical science, and conditions necessary to perform a valid analysis, it is hoped that this guide will serve as an educational tool to inspire more of our young people to study the science of measurement and analysis. This will help to ensure the supply of a skilled work-force so necessary for reaching the goal of safe drinking water for all.

There are, however, large numbers of households in rural communities who still do not have rural water services. There is, unfortunately, considerable misunderstnading of the nature of the backlog in water and sanitation in South Africa. In a recent paper (McK2004) mention is made of a backlog of some 14 million in 1994 and that delivery to 10 million had been achieved over the past decade; this meant that only some 4 million people remained to receive delivery. The situation with the backlog is, however, dynamic in two ways. Firstly there is an increase in population at a higher level than the national average among those who are not connected. Secondly the rate of increase in the number of households is considerably higher than that of population as the large 'extended' families fall away and are replaced by smaller 'simple' households. The result is that the challenge of effecting delivery and ending backlogs is raised.

The question of quality of water is closely linked to that of level of service. At the highest levels of service there is generally regular monitoring of water quality and the maintenance of safe water standards; at the level of standalone projects and many projects providing communal taps in rural communities there is not disinfection of water. There are enormous variations in service; while direct connections usually have water supply over a 24 hour cycle, communal taps in rural communities often operate on a morning and evening basis for two to four hours.

There are two concerns at the lower level of service; firstly to ensure that rural water services are operating efficiently with short breakdown time and quick repairs, and the secondly the quality of water is within the specified standards. The two concerns are closely connected.

Despite these reservations there are considerable benefits from piped rural water services; water sources are closer to most households and there is a considerable saving in the time taken by women in drawing water.

Rural water projects have much higher levels of interruption and much longer time taken for repairs to be effected (Hemson and Owusu-Ampomah, 2004) and this has decided effects on water quality. In a recent review of rural water schemes in the Western and Eastern Cape (Mackintosh and Colvin, 2003) water quality was found to be affected by difficulties of effective operations and maintenance. In the Eastern Cape sample the majority of the non-functional water schemes failed to achieve the Minimum Acceptable Level (MAL) in water quality.

Finally there is the question of the quality of water in stored containers, at the point-of-use. Largely because of the irregular and unsatisfactory operation of rural water schemes, rural households tend to store as much water as possible. This is recorded as leading to a considerably worsening quality of water as finally consumed almost irrespective of the safety of water at source (Gundry, Wright and Conroy: 2004).

Perceptions of water quality

Few reviews of water quality have taken into account consumer views although there are general support for measuring 'consumer opinion' in the commercial sense; of consumers buyng a service. It is argued here that there is a connection between the level and quality of service on the one hand and the safety and satisfaction with water serives on the other. Other surveys have found that rural populations report high levels of dissatisfaction with the safety and taste of the water provided by official projects.

In South Africa there are regular surveys of households to measure general social characteristics, access to services, quality of service, etc. In the past these have been termed October Household Surveys, now General Household Surveys (GHS); in the past GHS conducted in 2002 and currently available there was, as in other there are questions of access by households to services. In addition there was a series of questions relating to the quality of water, possibly prompted by the cholera epidemic of 2000-01.

In the section of the paper below an analysis is made of attitudes to safety, turbidity/clarity, and taste of water. The first level of analysis is that of a nation wide frequency table: this shows that out of 11,7 million households, an overwhelming majority of 89.6% were satisfied with the safety of their water supply.

General perception of safety of water

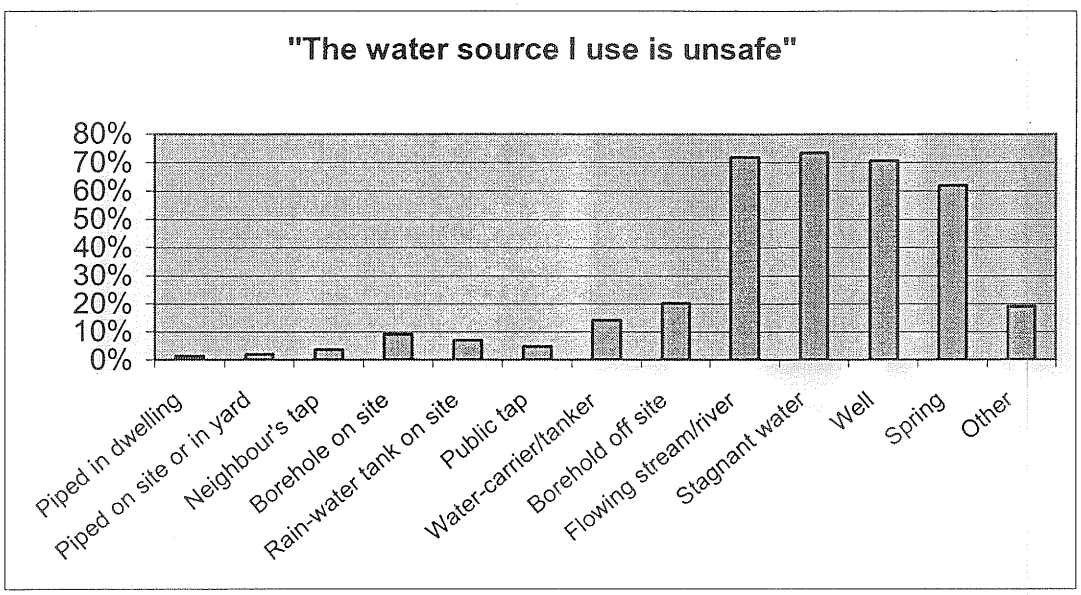
	Households	Percent
Safe	10,560,229	89.6
Unsafe	1,163,221	9.9
Unsure	56,929	0.5
Total	11,780,379	100

GHS, 2002: q410safe

Further analysis, however, shows that the minority reporting that their water supply was unsafe is based among the most vulnerable and poorest communities. Among this group which has a lower level of service or no service at all, perceptions of water quality are a significant source of dissatisfaction, and hence a fairly good measure of municipal efficiency in water service delivery, particularly among rural populations. In the GHS 2002 there are decided opinions expressed about the safety of water; in the table below there appears to be a sharp divide between piped water which is generally seen as safe or treated and unpiped sources which are generally seen as unsafe and untreated.

There is a marked divide between perceptions of water quality and level of service; this also largely replicates the urban/rural divide, and between the poorest and most vulnerable and the urban groupings of poor and rich. These differences are most graphically illustrated in the figure below which presents attitude towards the quality in relation to a question on safe water. In the figure below these attitudes ('not safe') are presented in terms of various levels of service.

Figure: Perception of water quality



It is immediately obvious that those with a higher level of service (to the left of the figure) feel that their water sources are safe but those who have the lower levels of service (to the right) have a high level of perception that their water is unsafe.

There are strong perceptions of the danger of drinking unsafe water represented here with as many as 73.4% reporting that drinking water accessed from stagnant sources (that is dams and pools) is unsafe. Again the highest level of service, domestic connections are seen as safest and stagnant water the unsafest.

These are marked differences in perception and show a sharp awareness of differences in quality. The question is what perception there is of water quality from the improved services provided by government in the past decade? There are about 1,6 million households accessing water from communal taps, the overwhelming majority of these in the rural areas (in addition there is a proportion of delivery in the form of site and domestic connections in these areas).

The table below shows that those drawing water from these sources overwhelmingly (95.1%) feel that their water is safe. The actual safety of water from these sources will be returned to below.

Perceptions of communal taps

	Households	Percent
Safe	1,516,792	95.1
Unsafe	69,959	4.4
Unsure	8,262	0.5
Total	1,595,013	100

GHS, 2002, q410safe

In relation to an 'improved' water source (such as a borehole 'off site', not necessarily with reticulation) there is not such strong perception of the safety of water. While only 20.5% (73,828 out of 360,773 households accessing water from this source) feel water from this source is unsafe, in the Eastern Cape 45.8% feel that their water is unsafe.

Another 'improved' source, wells, has a lower perception of safety with 70.7% of those accessing drinking water at this level (123,713 out of 175,070 households) reporting that they felt their water unsafe. In KwaZulu-Natal, Mpumalanga, Limpopo and the Eastern Cape there is a high level of perception that their water is not safe.

Perception of safety of water from wells

	Unsafe	Percent
EC	7,974	42.1%
FS	529	27.8%
KZN	51,867	79.4%
NW	1,333	21.9%
MP	3,488	75.2%
LIM	58,522	74.8%
	123,713	70.7%

The considerable differences in perception of quality arise from those making use of 'unimproved' sources

Rivers and streams

q410safe			Total	
1.00	2.00	9.00		2.00
189	364	0	553	65.8%
120,004	247,678	898	368,580	67.2%
1,926	1,499	0	3,425	43.8%
0	239	0	239	100.0%
53,948	195,510	326	249,784	78.3%
435	2,513	0	2,948	85.2%
3,704	11,529	0	15,233	75.7%
14,333	56,554	0	70,887	79.8%
194,539	515,886	1,224	711,649	72.5%

711,649

Stagnant water

prov * q410safe Crosstabulation

Count

		q410safe		Total	
		1.00	2.00		
prov	1.00	913	622	1535	40.5%

2.00	4753	25157	29910	84.1%
3.00	972	561	1533	36.6%
4.00	0	2598	2598	100.0%
5.00	9970	20316	30286	67.1%
6.00	810	433	1243	34.8%
8.00	1282	3874	5156	75.1%
9.00	2707	14113	16820	83.9%
Total	21407	67674	89081	76.0%

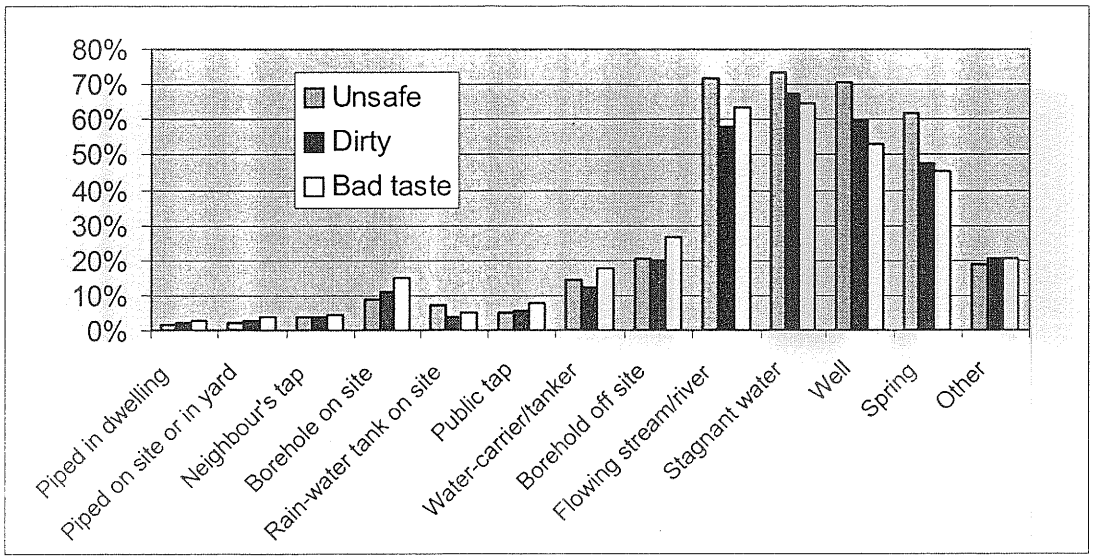
Spring: water quality

q410safe			
1.00	2.00		
100.0%		0	204
36.8%	63.2%	119,373	188,975
12.5%	87.5%	594	679
48.0%	52.0%	17,147	32,988
	100.0%	483	483
22.5%	77.5%	1,860	2,401
27.1%	72.9%	5,538	7,594
37.9%	62.1%	144,995	233,324

What is significant is the ranking of negative comments; in piped water taste is seen most negatively while in unpiped sources the safety issues predominate.

Perceptions of taste and clarity of water are closely connected with those of safety; these are seen slightly less negatively.

Figure How good is your water? A measure of dissatisfaction



GHS 2002

A perception is made of water quality which brings together safety, clarity, and taste; in the higher levels of service these are close associated and have low levels of dissatisfaction; among

General conclusion that piped water in dwelling or on site is acceptable in the following order: safety, cleanliness, and lastly in taste.

Improved water sources are considered less acceptable but

There is a strong regional perception to perceptions of water quality: the highest dissatisfaction with perceived unsafe water comes from the Eastern Cape, followed by Kwa-Zulu-Natal and Limpopo. These are the provinces, which have the highest level of communal or traditional sources of water, and the perceptions are seen to be linked to those sources.

Table Levels of dissatisfaction with unpiped water

Eastern Cape	34.70%
KwaZulu-Natal	29.20%
Limpopo	17.00%

In a number of provinces there are high levels of dissatisfaction; in the table below cases have been selected reporting poor tasting water. Of those who are dissatisfied with the taste of the water from wells 81.3% are located in the Eastern Cape, followed by those drawing water from flowing water. Among those dissatisfied with the taste of water from boreholes, 42.6% are located in KwaZulu-Natal; this shows considerable dissatisfaction about the taste of water from boreholes; among water engineers it is common knowledge that water from boreholes in northern KwaZulu-Natal tends to be brackish or salty tasting.

Table Points of dissatisfaction with poor taste

	Borehold off site/communal	Flowing water/stream/river	Dam/pool/stagnant water	Well
Eastern Cape	13.90%	46.70%	6.30%	81.30%
KwaZulu-Natal	42.60%	38.10%	40.60%	12.10%
Limpopo	22.80%	10.40%	46.40%	3.30%

GHS, 2002: The various columns do not add up to 100% as the 'rural' provinces with high levels of dissatisfaction are being displayed.

Undoubtedly the cholera epidemic and the public dissemination of information about the unsafe nature of untreated water have sharpened the perceptions of water being unsafe.

The perceptions of taste of water are probably long-standing and can be related to popular complaints at various rural water projects.

Free basic water service

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., 25*l* 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.

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; Hemson and Owusu-Ampomah, forthcoming).

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.[1] 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).

Bureaucracies not talking to each other

A number of spheres of government and departments involved: DWAF, Department of Health, and Department of Local and Provincial Government at a national level, and (in the rural context) provincial, district, and local governments at their respective levels. The urban metros tend to have their own systems of monitoring and regulation of water quality for some time which covers most areas with the exception of informal settlements which suffer extremely poor sanitation and more difficult access to clean water.

During the cholera epidemic 2000-01 the WHO officials reported that there were problems in communication and coordination between the departments of water and health (WHO, 2001). To some extent these were overcome during the epidemic through the use of the provision of Disaster legislation in the form of ad hoc action committees in the most affected areas. These helped coordinate departmental and local government initiatives to provide clean water on an emergency basis to affected communities, to coordinate with the army medical services, to provide bleach, etc. In the nature of disaster provision these forms of cooperation and coordination fell away with the decline of the epidemic into sporadic small clussters of infection.

The departments could be working together to ensure better quality water in rivers and in piped provision, but recent reviews of the monitoring of water quality do not mention any links. The following responsibilities and activities are potentially available:

Department of Water Affairs:

Regulator of the water services sector
Obligations in terms of the Water Services Act to maintain control of quality
Statutory obligation to pass water projects over to municipalities

[1] In the case of restrictions on water use, non-contribution would clearly be an unintended consequence.

Non interventionist policy on water quality; endorses steady improvement where this is taking place
Low level of coordination with the Department of Health

Department of Health

Recording diagnosis of water related diseases in clinics and hospitals, reporting these to local government, and to the Deparmtent of Water Affairs and Forestry as regulator;
Publishing records of statistics on diagnoses at a local, district and provincial level;
Establishing a policy towards water quality and the diseases associated with unsafe water, in particular diarrhea in rural areas and parasitic infections;
The provision of Environmental Health Practitioners to rural local government;

Clinic visits recorded with treatment and diagnosis, but statistics not available on a local, provincial, or national basis.
Problems with inter-departmental adjudication. A number of elements involved;

> This conference is intended to create an implementation platform for all stakeholders, especially civil society, to co-operate in the chase to achieve the Millennium Development Goals on safe water and sanitation. This gap between formal structures and the informal recipients is often cited as the reason for failure of water laws and policies being implemented successfully. Many actions contribute to this. This conference aims to create a grid between those empowered to deliver and those needing delivery most, by simplifying, enhancing and speeding up implementation.

A recent study of the quality of water in rural supply projects in the Eastern and Western Cape provinces concluded that more than 50% had water below the Minimum Acceptable Level (MAL). As i

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Human contact with schistosome-infested water was studied in a rapidly growing community near an industrial area: water-contact was observed and categorized; interviews concerning water usage were conducted and schoolchildren and adult women were tested for schistosome infections. Results indicated that swimming amongst certain young people was an important contact activity in summer. To a lesser extent the washing of clothes and blankets was found to be an activity of importance, providing a focus for the social gathering of women and young children in contact with the water throughout the year. One of the aims of the study was to develop cost-effective methods for use in this and other endemic areas to provide guidelines for control programmes. A comparison was made between methods of assessing exposure to the infection in their ability to predict the prevalence of Schistosoma haematobium and S. mansoni across age-sex classes of the human host; an exposure index which included an assessment of body surface area was found to be preferable to one based on duration of contact only. The differing relationships between exposure to infested water and prevalence of the two schistosome species were in accordance with reports from other areas, thus supporting the choice of minimum requirements for a survey prior to control.

Crawford R. You are dangerous to your health: the ideology and politics of victim blaming. Int J Health Serv 1977;7(4):663–680.

Volume 1: South African Water Quality Guidelines - Domestic Water Use
Volume 2: South African Water Quality Guidelines - Recreational Water Use
Volume 3: South African Water Quality Guidelines - Industrial Water Use
Volume 4: South African Water Quality Guidelines - Agricultural Water Use: Irrigation
Volume 5: South African Water Quality Guidelines - Agricultural Water Use: Livestock Watering
Volume 6: South African Water Quality Guidelines - Agricultural Water Use: Aquaculture
Volume 7: South African Water Quality Guidelines - Aquatic Ecosystems
Volume 8: South African Water Quality Guidelines - Field Guide

Clean Water State Revolving Fund (CWSRF) OUTCOME
Average number per year of waterborne disease outbreaks attributable to swimming in, or other recreational contact with the oceans, rivers, lakes or streams. The CWSRF provides funds to states to establish state loan revolving funds that finance infrastructure improvements for public wastewater systems and other sources of water quality impairment. The performance measure reflects the Agency's mission to protect public health and represents the highest level outcome measure in GAO's Hierarchy of Indicators.3 The Agency target is to decrease the number of outbreaks over time. Current measurement methodology lacks validity because the Agency relies on voluntary reporting to CDC and underreporting is a concern. The program is developing an annual measure of wastewater treatment plant compliance with discharge standards to link

treatment plant upgrades with improvement in water quality and further link water quality improvements to reductions in waterborne disease outbreaks.

A strategic assessment of water services

A review of four key targets of the Strategic Framework for Water Services compiled for the Department of Water and Forestry

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2 August 2004.

Water services : the challenge of rights

Water is essential to life; this understanding has been behind the drive to bring life sustaining clean water to the people in South Africa. The first preoccupation of public policy is that access to clean water should be opened for the people who have been denied such a right.

The health benefits from improved water and sanitation could be, and should be, immense. Adequate provision of both water and sanitation has an acute effect on child mortality rates: for those with piped water the child mortality rate is halved (from 27.7 to 11.6); and those with flush sanitation the child morality rate is a quarter of those who do not (from 34.9 to 7.7).[1] In addition the scourge of parasite infections would be ended.

Such statistics give an indication of what should be expected as a health impact of effective delivery.

Our task

This is the first strategic assessment undertaken by the Department which is making a historic turn from driving implementation to supporting and regulating water services which are now fully a municipal responsibility. In this assessement there is a focus on key targets.

In the Strategic Framework there is clearly a sense of urgency, a focus on deadlines and on backlogs to be met. There is a sense that there has to be close cooperation between departments to achieve improved water services for all. DWAF, as leader of the sector will be providing an annual review of goals and achievements.

Getting water services to the people

At the time of the historic Reconstruction and Development Programme (RDP) in 1994 there were 12 million people without water and 21 people without adequate sanitation. What has been achieved since then, and what progress have we made over the last year, in the targets set out by the Strategic Framework which has spelt out these targets and dates for achievement?

All people in South Africa have access to a functioning basic water supply facility by 2008 (Targets 1)

The evidence of the departmental figures is that substantial progress is being made towards providing access to piped water, mostly at the level of communal taps, in the past ten years. The figures are presented below; in Gauteng, Western Cape, Northern Cape, and Free State either all people have access to infrastructure or only 1% lack such access. In the 'rural' provinces: Eastern Cape and KwaZulu-Natal there are between 12-25% of the people either without any infrastructure or beyond 200m of that infrastructure.

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[1] Table 6.5, 1998 Demographic and Health Survey, Department of Health, 2001.

Delivery to basic infrastructure over the year 2003/4 was to 402,390 households.

All people in South Africa have access to a functioning basic sanitation facility by 2010 (Target 2)

Sanitation is the hallmark of public health and human dignity. It is also generally known that South Africa has been falling behind in the provision of sanitation, particularly in rural areas. The provinces where sanitation delivery is lagging are Limpopo, Eastern Cape, and the North West (72%, 57%, and 59% of households in these provinces have inadequate sanitation).

In the past year 250,000 households received adequate sanitation and DWAF Minister Sonjica has made a personal commitment to raising the level of adequate sanitation in her budget speech.

Delivery to basic sanitation over the year 2003/4 was to 163,490 households.

All schools have adequate and safe water supply and sanitation services by 2005 (Target 3)

Our schools should be the centres of health and hygiene education to improve the health, understanding and living standards of the rising generation. Teachers, officials, and public health engineers should all be united to educate and provide services to our schools to counter the very high levels of water-borne diseases among our children particularly in rural areas.

Currently out of a total of 27,458 schools 57% are without adequate water and between 59-66% have inadequate sanitation as defined by the Department of Education. The figures of those schools without *any* water supply alone are daunting: 7,817 in July 2002 which was reduced to 6,895 in April 2004.

In the past two years it appears that 992 schools received adequate sanitation.

All bucket toilets are eradicated by 2006 (Targets 5)

The bucket system is a menial and humiliating level of service; sited a distance from the house, public and smelly and described as 'unsuitable and inappropriate level of service' by the Strategic Framework[2].The evidence of the 2001 Census is that the highest proportion of the population by province is the Free State (150 000 households or 20% the population) followed by the Eastern Cape (85 000 and 6%).

Over the past three years rogress is being made. The numbers have been reduced in both provinces by 83 000 households in the Free State and 57 000 in the Eastern Cape. In other provinces such as the Northern Cape and Limpopo, however, numbers have not declined and may have even increased slightly.

[I'm checking on the figures from the FS; a DWAF official says the figures appear to be too optomistic.]

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[2] Page 47.

How have we done?

In South Africa we have extensive experience in working with communities, consulting the people,and building steering committees; this is the 'people-centred' development described by the RDP. We are also quite good at getting systems up and running.

The difficulties lie rather in keeping up capacity beyond the duration of a project into operations and maintenance; keeping systems working and working well. This is a challenge at the level of human ability and organization but also of adequate funding; our training and organisational systems have to be reinforced local and national revenues have to be dedicated to ensuring sustainability.

Remainining challenges

The challenge is to provide firstly a basic service to all households with 25 litres per person per day within 200 metres or better and a VIP (Ventilated Improved Privy) or better. From there the Strategic Framework talks of climbing the ladder to a better level of 50 litres per person per day.

Of the 3 137 000 households without access to basic water services, 839 000 are located in KwaZulu-Natal and 772 000 in the Eastern Cape. These are the two provinces which deserve the greatest and most urgent attention.

The same provinces suffer the largest backlogs in sanitation: KwaZulu-Natal (880 000 households), followed closely by the Eastern Cape (860 000 households) and Limpopo (851 000 households).

At the current rate of delivery, according to the statistics compiled by the DWAF Planning and Infrastructural Directorate, it would be possible to give everyone access to formal water supply infrastructure by 2010. This will, however, be supplied at a lower level than the basic service. To get water supply to all within 200 metres will take to 2012 -- 8 years from now.

In sanitation a large backlog has accumulated: some 4,3 million households (or just under 18 million people) still do not have access to a basic service in sanitation. At the current rate of delivery of 250 000 households per annum (a figure about double that of 2003/4) it would take approximately 17 years to address the sanitation problem.

In addition there are about 244,000 households still enduring the bucket system and awaiting an alternative improved service.

Areas of concern

In the transition in line responsibility from DWAF to DPLG is it essential that due care is given both to maintianing standards, reporting systems, and open monnitoring and evaluation. It is critically important that all data relating to delivery is readily available. In relation to municipalities, particularly in rural areas, there has to be more attention given to capacity building.

Sanitation in rural areas should have the highest priority, but it is also important that in accelerated delivery existing policies are not cast aside in the rush to get facilities in place. Communities should be fully involved in accepting the design of new facilities. In addition many

projects do not undertake health promotion during their implementation, although this is essential if there is to be a noticeable health improvement.

Meeting targets calls for the strongest commitment by local and national government, building capacity in local government and most importantly reviewing financial strategy.

It seems that the target of all schools to have adequate water and sanitation by next year (2005) will not be met. Indeed at the present rate of provision of water to schools it will take another 7 years for all to have a supply of any standard.

All these challenges require close cooperation and coordination between departments; a practice which is often difficult to achieve.7

Strategic issues and recommendations

In the Strategic Framework it is stated the gross inequalities have specific historical roots but it is also mentioned that our ability to deal with the services backlog is greater than most developing countries. The current level of delivery is described as an 'impressive achievement'.

There are, however, the following strategic issues which concentrate our attention:

- It is evident that the rate of sanitation delivery must be accelerated to serve approximately 700 000 households per annum in order to attain the target of clearing the sanitation backlog by 2010. This is a figure four times that currently being delivered and raises the question of budgetary commitment and capacity. But if the target is to be met delivery has to be accelerated.

- If the despised bucket system is to be eliminated by 2006 (which is just two years away), vigorous effort has to be made in the Free State and Eastern Cape through dedicated budgeting and commitment of personnel to this purpose.

- A new sense of urgency has to be infused into upgrading water supply and sanitation in our schools, to end parasite infections, and to transform them into health promoting institutions.

All in all considerable extra funding (of the order of R2 billion annually both in water and in sanitation) has to be allocated to meet the targets.

In the data which follows there is additional information on many of targets of the `. These will be supplemented in detailed analysis in the future reports.

An important start has been made in providing water to the people. Water is still highly unequally distributed and the poor often have the poorest quality and the least amount although often they need it the most. The government is committed to a pro-poor policy in which water services will be more evenly distributed and the health of the people improve. This commitment is now to be realised.