WATER AND SANITATION 2000

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WORKSHOP : STRATEGIES FOR WATER SUPPLY AND SANITATION PROVISION

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2. Current Situation in Rural Areas — Ian Pearson (CSIR)
3. Current Institutional Situation — Mike Muller (DBSA)
4. Future Institutional Issues and Approaches — Mike Muller
5. Future Trends and Issues — Barry Jackson (DBSA)

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2. A Review of International Experience (World Bank) David Grey.
3. Perspectives from Community Based Organisations (Planact)

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WATER AND SANITATION 2000

"a multi-disciplinary Southern African working group
to promote appropriate strategies and approaches
to improve water supply and sanitation
on an integrated, affordable and sustainable basis
for all communities in a situation of
increasing needs and limited resources."

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WORKSHOP : STRATEGIES FOR

WATER SUPPLY AND SANITATION PROVISION

Urban Water Supply and Sanitation

The Current Situation

1. INTRODUCTION

The aim of this paper is to provide an overview of the existing situation as regards water and sanitation provision in the urban areas of South Africa.

One component of this is obviously the numbers (the extent of coverage of water and sanitation and the cost of provision); but perhaps of more importance is the identification of the issues involved and a framework for collecting them. The collection of relevant data needs to be an ongoing part of a strategy of provision of water and sanitation. Lack of data and of a framework for collecting it points to a deficiency in water and sanitation strategy rather than simply a shortage of correct numbers.

In providing an overview of the existing situation of water and sanitation provision in the urban areas, this paper is therefore as much an attempt to contribute to the definition of that framework as to provide the numbers.

Five broad areas are addressed in this paper:

- the definition of "urban areas of South Africa"
- coverage statistics for water and sanitation provision
- costs of different options for provision
- current policies for provision and cost recovery
- other issues of importance to water and sanitation provision.

2. URBAN AREAS OF SOUTH AFRICA

The lack of commonly agreed areas to which any kind of data referred as well as the lack of coordinated responsibility for the different areas made comprehensive data difficult to obtain. Much of the difficulty stemmed from a lack of agreement as to what constitutes the "urban areas of South Africa"

The term "South Africa" is used in this paper in its broadest sense to include the independent homelands and self-governing territories in addition to the narrow definition of the term. For the term "urban areas", the Urban Foundation definition has been used.

The Urban Foundation Demographic Projection Model (Urban Foundation 1990a) recognises four categories of areas: Metropolitan areas, cities and towns, dense (or closer) settlements and rural areas. The model also makes a distinction between the homeland areas and the South African areas (in the narrow definition).

Eight **Metropolitan areas** are identified: the PWV, Durban, Pietermaritzburg, Cape Town, Port Elizabeth, Bloemfontein/ Botshabelo, OFS Goldfields and East London. As has been done throughout the Urban Foundation demographic research work, these centres have been defined "as including all suburbs or settlements in which the bulk of the population interact with each other on a daily basis" (Urban Foundation 1990b, p23). Most of these Metropolitan areas therefore include both homeland and SA portions (e.g. the Winterveld is regarded as part of Pretoria and Mdantsane as part of East London).

Although smaller than the metropolitan areas, the **cities and towns** are similarly defined (e.g. George/Mossel Bay, Kimberley, King Williamstown/Zwelitsha, Witbank, Rustenberg, Port Shepstone etc).

The **dense, or closer settlements** occur in rural homeland areas only, but are "agglomerations of mainly informal dwellings where people do not derive significant income from agriculture. Rather, most commute to urban or metropolitan centres (often 80km or more away)" (Urban Foundation 1990b p16). For the purposes of this study, "urban" is taken to exclude the dense settlements as they fall more naturally into the "rural" category for the purposes of water and sanitation provision.

The **rural areas** are made up of "those areas in which there are relatively lower population densities, and relatively high proportions of income derived from agriculture. While they include smaller towns and villages that service rural hinter-lands,the great bulk of the population of such areas are settled on the land" (Urban Foundation 1990b p16)

what criteria? how big/small?

3. COVERAGE BY WATER AND SANITATION PROVISION

3.1 Water and Sanitation provision

Water and sanitation provision includes several aspects. One aspect is the **physical infrastructure**, of which there are various technical options (e.g. water reticulation with a tap in every yard). The physical infrastructure includes both bulk and internal components.

A second aspect is its **performance** and other level of service criteria (e.g. quality and quantity of water provided), including the impact/implications of that performance for both the end-user and the environment.

Performance-related criteria such as quality and quantity of water, reliability of supply or time spent collecting water may also be used to measure level of service. They are useful for comparison or appraisal purposes but need to be translated into technical options for specification and costing. For the purposes of this paper therefore, water and sanitation provision will be categorised according to the various technical options.

Institutional aspects of provision will be covered in subsequent papers.

3.2 Approach Used and Assumptions Made to Estimate Coverage

The Urban Foundation Demographic Projection Model data (Urban Foundation 1990a) was used as the basis for the population figures. The model gives a breakdown of the population according to the different categories of areas (set out in section 2 above) as well as according to racial groupings. Both of these aspects were used in the estimation of coverage statistics.

With respect to the different categories of areas, the four largest metropolitan areas (the PWV, Durban/ Pietermaritzburg (combined), Cape Town and Port Elizabeth) together comprise

- 90% of the black metropolitan population;
- 70% of the black urban population; and
- 45% of the total urban population.

More effort was therefore concentrated on these areas in the collection of coverage data.

With respect to the racial classifications, the lack of access to water and sanitation was considered to occur primarily amongst black people. Racial classifications were also therefore used as a tool in determining service provision.

"**Housing type**" was a further set of data which was used to give an indication of service provision. The population figures were broken down according to "housing type", in particular into formal and informal housing; for formal housing the figures were further broken down into backyard shacks, garages/outbuildings and freestanding settlements. Service provision was then linked to "housing type" (e.g. backyard shacks would generally have limited access to the services of the formal house on the site).

Specific data on service provision in particular townships and settlements was used where suitable to supplement the above data. Overall figures on service provision (e.g. in the non-Metropolitan"black" urban areas buckets are used by about 30% of the population) were also used.

Where service provision figures could not be obtained, estimates were made.

The base date for population figures has been taken as January 1990. A number of population estimates (e.g. for informal settlements) and costs are however current ones but have not been adjusted to the base date figures as it is felt that they are still within the range of accuracy of the data.

More detailed explanations of how the coverage figures were arrived at are given in the annexures (available separately).

3.3 Population figures

A summary of the Urban Foundation Demographic Projection Model population figures for 1990 is given in the table below.

	ASIAN	WHITE	COLOURED	BLACK	TOTAL
URBAN:					
METROPOLITAN	826 600	3 580 400	1 936 500	6 681 000	13 024 500
HOMELAND METRO	3 600	1 700	4 800	4 346 600	4 356 700
TOTAL METRO	830 200	3 582 100	1 941 300	11 027 600	17 381 200
URBAN	105 400	1 078 700	770 100	1 883 200	3 837 400
HOMELAND URBAN	800	6 500	6 000	1 071 900	1 085 200
SUB-TOT URBAN	106 200	1 085 200	776 100	2 955 100	4 922 600
TOTAL URBAN	**936 400**	**4 667 300**	**2 717 400**	**13 982 700**	**22 303 800**
RURAL:					
RURAL	37 900	370 200	509 200	3 351 500	4 268 800
HOMELAND DENSE	0	0	0	2 222 300	2 222 300
HOMELAND RURAL	4 000	14 600	17 800	8 702 100	8 738 500
TOTAL RURAL	**41 900**	**384 800**	**527 000**	**14 275 900**	**15 229 600**
TOTAL:					
URBAN+RURAL	**978 300**	**5 052 100**	**3 244 400**	**28 258 600**	**37 533 400**

A further breakdown of the population of the metropolitan areas is given in the table below.

	ASIAN	WHITE	COLOURED	BLACK	TOTAL
PWV	130 300	2 076 300	256 900	6 280 200	8 743 700
DURBAN	596 700	354 400	71 500	2 063 200	3 085 800
PIETERMARITZBURG	68 700	67 500	16 500	338 700	491 400
CAPE TOWN	22 200	626 500	1 337 100	570 000	2 555 800
PORT ELIZABETH	8 900	194 200	201 000	580 000	984 100
BLOEMFONTEIN	0	107 400	24 200	470 100	601 700
OFS GOLDFIELDS	0	78 300	7 300	382 600	468 200
EAST LONDON	3 400	77 500	26 800	342 800	450 500
TOTAL METRO	830 200	3 582 100	1 941 300	11 027 600	17 381 200

3.4 Levels of service for water supply and sanitation provision

A number of different groupings of technical options are recognised. One such set of groupings is that proposed by the CSIR/Department of Development Aid (1988); another set is the Level of Service matrix compiled by the South African Housing Advisory Council in cooperation with the Division of Building Technology of CSIR (1988).

The set of groupings used for the purposes of this study, which is a shortened version of the two with some modifications, is as follows:

Sanitation:	**Water Supply:**
Minimal provision	Minimal provision
Buckets	Water kiosk
Ventilated Improved Pit latrine	Standpipe at 250m
Aquaprivy with soakaway	Metered yard tap
Waterborne sewerage	Metered house connection

Particular points of note regarding the options are given below.

3.4.1 Water supply

Minimal provision

The term "minimal" is used in the sense of "slight"; it is not intended to be a "minimum level of provision"; nor is it intended to mean "no provision at all". (Water being a basic necessity of life, people will find water somewhere, however difficult it may be to obtain or however bad the source may be). Included in this category are:

- all natural and informal sources such as rivers, streams, springs (protected and unprotected)
- small unassured supplies such as rainwater tanks
- where access to provision is limited e.g. where waiting times in queues are excessive or where topography and/or distance to the source makes carrying times excessive.

Water kiosk

In the Inanda area in Natal where Department of Development Aid has set up a network of kiosks, people generally walk between 100 and 250m to use the kiosks (Rivett–Carnac 1989).

Can kiosk not be classed with standpipe?

Standpipe at 250m

The 250 metres refers to the distance that a household would have to walk to fetch water, not to the spacing between standpipes.

3.4.2 Sanitation

Minimal provision

This category is similar to the equivalent water supply category. Included in this category are

- unimproved pit latrines
- secondary or shared access to provision as in the case of backyard shack dwellers

Ventilated Improved Pit latrine
The VIP is detached from house and includes a superstructure and simple seat or squat plate.

Outside aquaprivy with soakaway
The tank should normally be large enough for a unit supplying a family of say 6 to need desludging not more than every 2–3years. Water usage is taken to be about 100l/site/day – a tenth of that required for full waterborne sewerage – serving a family of 6.

Waterborne sanitation to sewer system
This includes the toilet bowl, the shelter, simple plumbing and fixtures that would normally accompany the provision of waterborne sewerage (e.g. a hand basin) as well as the sewer reticulation and treatment facilities required. A distinction is made between internal and bulk service provision. The local sewer network in the township is included as part of the internal services whereas the link sewers and bulk treatment works are what make up the bulk services. Sewage flow is taken to be about 1000l/site/day serving a family of 6.

3.5 Coverage figures

Using the broad approach outlined in section 3.2 above, estimated coverage figures for water supply and sanitation were obtained for the urban areas and are summarised in the table below.

The following broad assumptions were made as regards service provision, applied to all areas:

- all who are formally housed in the urban areas have waterborne sewerage and a house connection for water supply.

- Of those informally housed, those in backyard shacks and outbuildings/garages have shared access to the water and sanitation of the main dwelling, but (especially where there are more than two dwellings per erf) access to these services would be limited. Most (80%) were therefore assumed to have access to a yard tap with the remaining 20% having minimal provision. Very few (10% or less) were assumed to have access to sanitation;

- For those in scattered shacks and freestanding settlements, unimproved pit latrines (if at all) is the probable level of service for sanitation; and informal sources, standpipes at a large distance away or from water vendors/land owners, the level of service for water supply (in other words minimal service provision for both water and sanitation).

A more detailed breakdown of the figures, indicating sources used and how the various figures were arrived at are given in the annexures.

ESTIMATED COVERAGE
(all figures in millions)

AREA	TOT POP	SANITATION MIN	BU	VIP	AP	WB	WATER SUPPLY MIN	WK	SP	YT	HC
PWV	8.75	3.45	–	0.15	0.15	5.0	1.8	–	0.3	1.9	4.75
DURBAN/ MARITZBURG	3.60	1.65	–	0.05	–	1.9	0.8	0.4	0.4	0.1	1.9
CAPE TOWN	2.55	0.35	0.1	–	–	2.1	0.2	–	0.1	0.25	2.0
PORT ELIZABETH	1.00	0.2	0.1	–	–	0.7	0.15	–	0.1	0.05	0.7
OTHER MET.	1.50	0.6	0.1	–	–	0.8	0.4	–	0.2	0.2	0.7
OTHER URBAN	4.90	1.1	0.4	–	–	3.4	0.6	0.1	0.5	0.5	3.2
TOTAL COVERAGE	**22.30**	**7.35**	**0.7**	**0.2**	**0.15**	**13.9**	**3.95**	**0.5**	**1.6**	**3.0**	**13.25**
PERCENT	100%	33%	3%	1%	1%	62%	18%	2%	7%	14%	59%

LEGEND:

SANITATION:
- MIN minimal
- BU buckets
- VIP ventilated improved pit
- AP aquaprivy with soakaway
- WB waterborne sewerage

WATER SUPPLY:
- MIN minimal
- WK water kiosk
- SP stand pipe at 250m
- YT metered yard tap
- HC metered house connection

4. COSTS OF VARIOUS LEVELS OF SERVICE PROVISION

Costs (both capital and operating) for the various levels of service were obtained from several sources. The range of costs was substantial, partly due to location-specific factors, but also due to different interpretations of the various levels of service. That full spectrum has not been reflected here. The range of costs given below is a tighter range of figures for the levels of service as described in section 3.4.

The average figures should be used with caution. With difficult site conditions (such as difficult ground conditions and steep topography), the figures could be as much as double the "high" figures quoted.

Operating costs have had all interest and redemption charges removed i.e. there is no "capital" portion hidden in the operating costs (except the capital cost portion of the raw water).

Capital costs are current replacement costs. They are also "at capacity" costs i.e. there is no allowance for underutilisation. It could be argued however that to ensure that bulk supply infrastructure remains able to meet the demand, it will on average over an extended period be underutilised and that some allowance should be made for this in assessing the costs. The bulk infrastructure costs given here are therefore lower than they are likely to be in practice.

Capital costs for bulk infrastructure are normally included as part of the running costs for provision i.e. capital redemption is included in the tariff. Expressed as a one-off cost, the cost appears higher than if it is expressed as an ongoing annual cost e.g. a capital cost of R2000 per site for bulk services for waterborne sewerage gives a very different impression of cost to a ongoing cost of even R1/kl.

CODE	DESCRIPTION	SEWAGE/WATER USAGE l/site/d	l/c/d	COST/SITE CAPITAL COST RANGE R/site	AVE R/site	COST/CAP OPER COST R/site/a	CAP R/cap	OPER R/cap/annum
WATER SUPPLY								
WK	**Water kiosk**	120	20	300–400	350	–	60	–
	Bulk services				240	50		40 8
	Total				**590**	**50**	**100**	**8**
SP	**Standpipe at 250m**	200	30	300–450	400	–	65	–
	Bulk services				400	80		65 13
	Total				**800**	**80**	**130**	**13**
YT	**Metered yard tap**	500	80	450–800	600	–	100	–
	Bulk services				1000	200		165 33
	Total				**1600**	**200**	**265**	**33**
HC	**Metered house connection**	1200	200	500–1500	700	–	115	–
	Bulk services				2400	475		400 79
	Total				**3100**	**475**	**515**	**79**
	Bulk services: (Treatment, storage and distribution)				**R2000/Ml/d**	**R1.10/kl**		
SANITATION								
BU	**Bucket latrine**	–	–	–	–	**360**	–	**60**
VIP	**Ventilated Improved Pit**	–	–	600–1500	**1000**	**25**	**170**	**4**
AP	**Aquaprivy**	100	17	700–1700	**1100**	**30**	**180**	**5**
WB	**Waterborne sanitation**	1000 ?	170	1500–3000	2500	–	420	–
	Bulk services				2000	150		330 25
	Total				**4500**	**150**	**750**	**25**
	Bulk services: (Link sewers and treatment)			**R1500–3000/Ml/d ave: R2000/Ml/d**		**40c/kl**		

Study (Ivory Park)

The capital costs of the bulk services for each technical option are calculated pro-rata on sewage/water usage. The figures for bulk services expressed in R/Ml/d and c/kl have been worked into the tables (indicated as bulk services under each technical option). They do not have to be added to the figures given.

The cost of waterborne sewerage excludes the cost (both capital and operating) of the water used; the cost is included in the cost of the metered house connections where the water usage figure of 1200 l/c/d includes the water for waterborne sewerage. In converting the figures per site to figures per capita, a number of six residents per site has been assumed. Further details of how the figures for the bulk services were arrived at are given in an annexure.

5. CURRENT POLICIES - PROVISION AND COST RECOVERY

There is broad agreement on the goal of provision of services, but with slightly different approaches being adopted as regards the desirable or minimum level of service. Both this issue and the issue of cost recovery are covered in more detail in another paper

As regards the cost recovery, two fairly common policies seem to be evident:

The first is for domestic users to be subsidised by commercial and industrial users. For example in the 1989/90 year the Johannesburg City Council tariff for domestic users was R1.00/kl as against R1.695/kl for commercial and industrial users.

The second is a sliding scale tariff which subsidises the low-consumption user. One example is the Bophutatswana Water Supply Authority's provisional tariffs - 54c/kl for the first 20kl/household/month (667l/site/d); above that the tariff is 92c/kl.

6. OTHER ISSUES OF IMPORTANCE

Concern has been widely expressed at the effect on the limited water resources of the country of diffuse pollution from high density unserviced settlements (Umgeni Water 1989 and Lubout et al 1991). This is seen however as a separate, although related, issue to the lack of service provision in the communities involved.

Another issue of concern is pollution from all forms of sanitation provision, both on-site and off-site. Although it was a fairly specific study, the findings of a CSIR Division of Building Technology/Department of Development Aid study on alternative sanitation systems at Inanda that, there was "a serious groundwater contamination problem from this sanitation system which is probably due to leaking or broken pipes" (CSIR DBT/Department of Development Aid 1989) is of note.

* in the case of water borne sewerage,

In the PWV area in particular, the issue of construction and provision of services on dolomitic areas (if it is to continue at all) is a further area of concern, with the possibility of sinkhole formation as well as pollution of the underground water resource.

7. CONCLUSIONS

The large metropolitan areas currently make up over 75% of the total urban population and include significant numbers of people in homeland areas who are often poorly served with water and sanitation.

A first estimate of water and sanitation coverage indicates that, out of the current urban population of 22 million:

- **4 million people (20%) have minimal water supply provision;**
- **7 million(33%) have minimal sanitation provision;**
- **13 to 14 million (60%) have good provision of both water supply and sanitation.**

As regards the costs of the various technical options, the capital and operating costs of infrastructure must not be confused. In particular,

the practice of treating the capital cost of bulk infrastructure as an ongoing cost while treating the capital cost of the internal infrastructure as a one-off cost is potentially misleading.

Lastly, the capital costs of the bulk services are of the same magnitude as the internal services and must be given due consideration in any discussion, at a local level, of the costs of the various technical options.

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WORKSHOP : STRATEGIES FOR

WATER SUPPLY AND SANITATION PROVISION

Rural Water Supply and Sanitation

The Current Situation

1. INTRODUCTION

It has been recognised that two of the basic needs of human beings, after their safety needs have been met, are an adequate supply of water and access to facilities for the safe disposal of human wastes. It was these needs which led the United Nation's member states to declare the 1980's as the International Water Supply and Sanitation Decade. The aim was to provide everyone with access to an adequate supply of safe drinking water and sanitation by the end of that decade.

In the rural areas of South Africa, improved access to water for domestic purposes has long been perceived as the most important need of rural dwellers. However, at the end of the 1980's there are still many millions in this country who do not enjoy access to adequate water or sanitation facilities despite marked successes being achieved in some areas.

This paper attempts to quantify the extent of water supply and sanitation coverage in the rural areas, and to estimate the cost of the alternative technologies which have been implemented in the rural areas, both in terms of capital costs and subsequent operational costs.

Before presenting these estimates, some background information may be helpful. There are a number of reasons for the lack of services in many of South Africa's rural communities. These include:

* The remoteness of many rural areas which means that the people who live there have not had access to the knowledge or resources required to improve their situation;

* Lack of commitment by relevant authorities to meet this need due to numerous other priorities;

* Shortage of necessary skills and knowledge to introduce technologies which are affordable and sustainable, and ensure maximum coverage;

* Lack of finances to implement and/or maintain ambitious schemes;

* No coordinated central government policy and support.

Hence, while much has been said, and many smaller organisations have been active, the progress in water supply and sanitation coverage in the rural areas has been disappointing. In areas where schemes have been implemented and coverage is high, the systems are only sustainable due to a considerable government input in terms of finances and maintenance personnel. Very little cost recovery is practised which implies that budgets for other development projects are being severely curtailed.

It is even difficult to try and quantify the extent of coverage at the present time since few records have been kept in an accessible form. Unfortunately, while the recent census asked, for instance, how many lounges are in a person's home, no information was collected on peoples' access to the basic needs of water and sanitation.

? has this issue been taken up?

2. RURAL POPULATION - SIZE AND DISTRIBUTION

Some estimates put the rural population of South Africa at as much as 60% of the total. However, it is necessary to define what is meant by rural in this context.

For the purposes of this assessment we define rural as being composed of the following groups:

* Scattered homesteads relying wholly or partially on agriculture for their livelihood;

* Villages in agricultural areas where the majority of residents are involved in some agriculture related activities;

* Villages remote from urban centres (20 km minimum) where significant industrial and commercial activities are not taking place and the number of residents is less than 20 000.

With these definitions, the number of people presently living in rural areas is of the order of 16 million.

Estimates of the rural population and its distribution are as follows:

AREA	NUMBER
Gazankulu	750 000
KaNgwane	350 000
KwaNdebele	300 000
KwaZulu	3 500 000
Lebowa	2 500 000
Qwaqwa	300 000
Bophuthatswana	1 300 000
Ciskei	500 000
Transkei	2 500 000
Venda	400 000
Homeland (s/total)	**12 400 000**
SA Dev. Trust	200 000
Provincial land	500 000
Commercial farms	3 500 000
TOTAL	**16 600 000**

The remoteness and scattered nature of many of the rural communities, makes it costly to provide them with centrally controlled water supply and sanitation systems. A number of more appropriate technologies are consequently employed to provide water and sanitation to rural communities, although in some areas centrally controlled systems are still preferred.

3. TECHNOLOGIES FOR WATER SUPPLY AND SANITATION

People in the rural areas have for many centuries been responsible for their own individual water supply and sanitation facilities. Water has been obtained from open springs, streams, rivers, ponds or dams; and from dug wells. The existence of a suitable water source has often been a primary reason for people to have settled in particular areas. Sanitation practises have in general been rudimentary in that people have either helped themselves in the open veld, or have constructed simple pit latrines.

Four developments have resulted in a change in attitude to water supply and sanitation. These are as follows:

* population increases have resulted in many traditional water sources becoming inadequate, especially during the dry periods of the year and during droughts;

* research has resulted in an improved knowledge of disease transmission and the dangers of using unprotected water sources and inadequate sanitation;

* technological developments have made possible the use of water supply systems which can provide a more convenient source of safe water, and sanitation systems which do not contribute to the spread of diseases.

* International attention has been focused on water supply and sanitation in unserviced areas, and most developing countries have given priority to achieving certain goals in this arena.

Experience internationally has pointed to the need for community participation and management in water supply and sanitation upgrading schemes, the use of appropriate technology, and the need for cost recovery in such schemes (especially in terms of operation and maintenance).

In South Africa the technologies and systems which have been implemented in the rural areas are briefly described in the following sections.

3.1 Rural water supply technologies

Water supply improvements which have been implemented in the rural areas of Southern Africa include the following:

Protected traditional sources:

For example spring protection whereby the water from a spring is made available at source before it can be contaminated; or the covering of a shallow well and installation of a suitable pump to prevent contamination of the well water. (**Rainwater collection** from roofs is also included in this category).

Ground water extraction by means of handpumps on boreholes

In this case handpumps are installed on shallow and medium depth boreholes. Maintenance is usually undertaken by a central authority.

Local water supply schemes:

Water is extracted, treated if required, and distributed to the community by means of a few taps. Possible sources include boreholes equipped with either a windmill, a diesel pump, or an electric pump; a spring protection scheme with a distribution pipe network; or water extracted from a stream or dam, treated by filtration and disinfection, and then distributed as above. The source of water is, by definition, within close proximity of the residential area.

Centralised water supply schemes:

Regional schemes consist of large reservoirs supplying water to a central treatment works. The water is subsequently pumped via long pipelines to a number of rural communities. The individual communities then obtain water from a local storage reservoir and distribute it further.

3.2 Sanitation systems in rural areas

Improved Pit Latrines:

Pit latrines, while providing privacy, may still present significant health hazards to users. Improved pit latrines, such as the VIP, overcome fly and odour problems.

Flush latrines with on-site disposal:

Such systems include the aquaprivies, septic tank systems, and digesters, all connected to some form of soak-away.

4. ESTIMATED COVERAGE IN RURAL AREAS

Coverage refers to the number or percentage of homes which have access to an improved water supply or to adequate individual sanitation. Figures on coverage are difficult to obtain as in many cases records have not been kept in an accessible form. Rough estimates of coverage from available records and personal communication are as follows:

	TOTAL	WATER SUPPLY		SANITATION	
	POPULATION	%	Number	%	Number
Gazankulu	750 000	95%	712 500	20%	150 000
KaNgwane	350 000	75%	262 500	20%	70 000
KwaNdebele	300 000	90%	270 000	30%	90 000
KwaZulu	3 500 000	25%	875 000	10%	350 000
Lebowa	2 500 000	50%	1 250 000	10%	250 000
Qwaqwa	300 000	90%	270 000	20%	60 000
Bophuthatswana	1 300 000	60%	780 000	20%	260 000
Ciskei	500 000	60%	300 000	20%	100 000
Transkei	2 500 000	25%	625 000	10%	250 000
Venda	400 000	80%	320 000	10%	40 000
Sub Total Homelands	**12 400 000**				
SA Dev. Trust	200 000	60%	120 000	10%	20 000
Provincial land	500 000	50%	250 000	10%	50 000
Commercial farms	3 500 000	80%	2 800 000	20%	70 000
TOTAL	**16 600 000**	**53%**	**8 835 000**	**14%**	**2 390 000**

The wide disparity in the figures for water supply is as much a reflection of different understandings of "adequacy" by the different authorities as of differences in levels of supply. In general, it may however be said that approximately 30 to 40% of rural households have ready access to an adequate supply of safe drinking water, and another 30 to 40% have access to an improved supply which requires upgrading before it can be called adequate.

These figures also indicate that generally little attention has been paid to upgrading of sanitation in rural areas. This is understandable since sanitation is the responsibility of individual households. However poor sanitation leads to the spread of disease which may counteract any health advantages of an improved water supply.

5. APPROACHES TO SERVICE PROVISION

There is at present no uniform policy regarding the provision of water supplies and sanitation in rural areas in South Africa as a whole. Each individual homeland or state authority was given responsibilities for this, but with little guidance on the optimum or even recommended methods for accomplishing this task. A number of non-state organisations have also become involved in this arena.

As a result a wide range of approaches have been adopted to deal with the provision of water and sanitation in rural areas.

By 1980, at the beginning of the Water Decade, most authorities had adopted the approach that water would be supplied to rural areas through regional schemes. This involved conventional engineering designs of dams, treatment works, and a costly system of storage reservoirs, pump stations and distribution networks.

In the drought years of the early mid eighties it was realised that large regional schemes were too costly to implement as well as to operate, and the time required between initiation and final implementation was to long to meet the immediate needs of the drought. Consequently most authorities switched to supplying emergency relief in the form of small schemes, usually based on a borehole with diesel pump and a small distribution network.

During this period, a number of non-state organisations also became involved in the water projects in rural areas. Lessons learnt from international experience were being published and the smaller NGOs were more easily able to adopt the newer community-based approaches to water supply. State authorities found it difficult to make a rapid switch to such approaches because this implied the appointment of additional staff and the much longer lead times to project implementation. In addition the newer approaches had not been well demonstrated and a number of uncertainties existed in their ability to be well operated and maintained.

Later in the 80's, financial constraints became more acute for government authorities at all levels. The high cost of operating and maintaining the regional and small emergency supply schemes was identified as a severe drain on their resources. Development Bank loans were becoming conditional on community participation and plans for cost recovery, and many authorities began to look into ways of including communities in the water supply programmes. Cost recovery was introduced at a low level in many areas.

Problems associated with the larger 'government' water supply schemes are generally as follows:

- there is little or no cost recovery from beneficiaries;
- skilled operators and managers are difficult to find and retain;
- costs (capital and running) are high;
- there is a lack of commitment to schemes by communities; and
- there is minimal involvement of the community in planning, implementation, operation or maintenance of the schemes.

As a consequence of financial constraints, most authorities are now aware of the need for more cost effective approaches to rural water supply provision. The present focus of government authorities is in general still on regional schemes, in particular on completing schemes which were planned and initiated in previous years. However, many authorities are beginning to pay more attention to the provision of small schemes and to assisting the work of NGO's in developing small schemes.

Sanitation remains a minor concern. It is generally regarded as the responsibility of householders except in the case of public facilities like schools and clinics. The Departments of Education and of Health often accept the responsibility of supplying latrines at such facilities. Only in a few isolated instances are householders assisted to provide themselves with improved sanitation facilities.

6. ESTIMATED COSTS OF RURAL SERVICE PROVISION

The estimated costs for supplying safe water (20 l/cap/day minimum) to a rural village of 250 homes (1500 – 2000 people i.e. average of 7 people/household) within a radius of 1.5 km (1990 prices) is as follows: Initial capital + labour

1. **Spring protection :** 2 springs, 4 x 5000l tanks, 4 km pipe, 30 stand pipes, labour + supervision;

   R 30 000 or **R 120/household**

2. **Rainwater collection :** gutters, downpipes, storage tank (5000l), first flush discharge, labour + supervision;

   R300 000 or **R1 200/household**

3. **Groundwater (handpump) :** 6 boreholes fitted with handpumps

   R 72 000 or **R 288/household**

4. **Groundwater (diesel) :** borehole fitted with diesel pump, 4 x 5000l tanks, 4 km pipe, 30 taps, labour + supervision;

   R 40 000 or **R 160/household**

5. **Surface water (local) :** pump, treatment (slow sand filtration, chlorination), 4 x 5000l storage tanks, 4 km pipe, 30 taps, labour + supervision;

   R 70 000 or **R 280/household**

6. **Regional scheme (pipeline supply):** 1 x 20 000l tank, 4 km internal pipe, 30 stand pipes, labour, supervision, portion of regional scheme costs;

   R1 500 000 or **R4 500/household**

The associated operation and maintenance costs (excluding capital redemption) for such systems are as follows:

1. R 2 500 p.a. or R 10/household
2. R 2 500 p.a. or R 10/household
3. R 5 000 p.a. or R 20/household
4. R30 000 p.a or R120/household
5. R25 000 p.a. or R100/household
6. R30 000 p.a. or R120/household

The estimated cost for individual household sanitation in rural areas is as follows:

1. **Ventilated Improved Pit Latrine (VIP) with various** superstructures;

   R 300 - R 1 000

2. **Flush toilet with septic tank**/digester and soak-away;

   R 2 000 - R 3 500

The associated operation and maintenance costs are as follows:

1. R 10 - R 60 per annum
2. R 75 - R 225 per annum

7. CONCLUSIONS

The estimated costs associated with supplying an additional 10 million rural dwellers with an adequate supply of drinking water, and some 15 million people with adequate sanitation is thus as follows (1990 Rands):

WATER : **R 200 to R 400 million (springs and handpumps)**

R 7 500 to R 10 500 million (regional schemes)

SANITATION : **R 700 to R 2 500 million (VIP latrines)**

R 6 500 to R 8 400 million (waterborne systems)

It can be seen that the technical approach taken can alter, by an order of magnitude, the costs of service provision. It should however be noted that in many communities, use of the cheaper options may not be technically feasible.

WATER AND SANITATION 2000

WORKSHOP : STRATEGIES FOR

WATER SUPPLY AND SANITATION PROVISION

Current Institutional Situation

1. INTRODUCTION

This review of the institutional framework, within which water supply and sanitation provision is made, is informed by two main considerations. First, there has been extensive conflict over the provision of and payment for these services. Secondly, the available information about service coverage suggests that existing institutions have failed to meet the evident needs of the communities they serve.

Conflict over the provision of services is not unique to the water and sanitation sector. In other sectors however, notably those of electricity supply and urban housing, similar problems have been encountered and innovative approaches developed to address them. It is noteworthy that many of these solutions have depended more on institutional than on technical innovations.

Political developments in South Africa are obliging all those involved in service provision (both as suppliers and as consumers) to review the institutional arrangements with a view to meeting unserved needs.

The purpose of this paper is thus to outline some elements of the current institutional situation with regard to water supply and sanitation provision. The focus is particularly on those institutions which service the needs of the poorer communities although the review must of necessity cover the whole sector. The objective, however, is to provide a basis from which future alternatives can be discussed.

2. AREAS OF NEED

This paper deals with the whole of South Africa (1910 boundaries), including the "national states". Within this scope, a number of areas of particular need can be identified upon which it is proposed to focus.

From an institutional perspective, it is important to recognise that the present situation is inevitably related to the past. Thus service provision and its organisation in the homelands reflects central government's broader policy of maintaining standards in the "developed" areas while helping communities in the "developing" areas to help themselves. The limited and poorly developed institutional capacity in these areas is a consequence of these policies and is reflected in the low level of service provision.

In this context, it is also necessary to recognise that the majority of people in the so-called "rural" areas do not make a living from the land. They are more often effectively "displaced urban" dwellers who subsist on funds remitted from the cities. Their service needs are frequently urban rather than rural in nature although they do not have the benefit of access to the urban economy to enable them to fund such services.

In black urban areas the institutional strengths and weaknesses and the approach to service provision also reflect past policy. Wide differences in service standards have occurred due in part to the subjective preferences of the implementing agencies as well as to local political sensitivities. The communities who are worst served are frequently those whose legal status and tenure is least secure and thus those for whom institutional support is least evident.

"Needs" are often perceived differently by professionals and by the communities themselves but there does appear to be a consensus that both water supply and sanitation are priority problems. This is particularly true for water supply in the rural and denser "resettlement" areas. It has also been noted that sanitation is perceived to be a problem in both the crowded inner townships of the PWV and amongst farm workers on white farms as well as in the dense resettlement areas such as the Winterveld north of Pretoria.

Against this broad background and considering the information presented in the previous two papers (dealing with the provision of services in Urban and Rural areas respectively), it is suggested that the critical areas to be addressed are:

- service provision and management, in existing black townships where local authority status is in dispute;

- provision and management of services in newly urbanised communities in the metropolitan areas;

- water supply to peri-urbanand large, dense rural communities which fall outside the boundaries of proclaimed towns and local government areas;

- approaches to water supply and sanitation in true rural areas in the homelands and elsewhere.

3. INSTITUTIONAL ASPECTS OF SERVICE COVERAGE

3.1 Background

Any discussion of the institutional framework for water supply has to be informed by a knowledge of the extent of the unserved needs which have to be met. As noted in the previous papers, there is scant information about coverage by either service. This in itself is an indicator of institutional problems.

These problems include the fragmentation of government and of statistical services and the fact that there is no single authority charged with ensuring that the basic water and sanitation needs of all South Africans are met. Estimates of service coverage have been presented in the other papers. There are however some problems of definition which are dealt with below since they are of relevance in the institutional context.

3.2 Water Supply

The availability of piped water does not necessarily mean that acceptable levels of service have been achieved – nor is the delivery of water in pipes the only means of achieving an acceptable service. Institutionally related concerns such as supply reliability and substandard water quality are important as are more general issues such as excessive distance of sources from households. Similar factors apply to other water sources as well.

3.3 Sanitation

In many urban areas, large numbers of people occupy single sites (due to the shortage of accessible, serviced land for housing). If the objective for sanitation provision is access to a hygienic toilet for each family unit, then even fully sewered urban areas cannot be said to be adequately served. Here the question is again largely institutional, both at the level of organisation of the dwellers on the individual plot as well as at the broader level of the community although it could be argued that the problem is one of shelter provision not sanitation.

In the case of on-site sanitation, based on pit latrines, some definition of "acceptable" is required given the anecdotal evidence suggesting that much of it is grossly unsatisfactory. Whether such provision is adequate in sanitary terms, or even used, has to be determined and institutional responsibility for this defined.

In institutional terms, it should also be noted that on-site sanitation is frequently provided as part of the construction of the dwelling. This implies a less direct role for the water supply and sanitation agency. In other countries, it has however been found that a sectorially supported programme to promote the construction of sanitation facilities and their hygienic use is essential if adequate coverage and standards of construction are to be attained and health benefits achieved.

3.4 Operation and Maintenance

As implied above, the provision of infrastructure is only beneficial if that infrastructure is operated correctly. The perception generally is that services are not well managed; this is one of the reasons given for the wave of rent boycotts in even the better served urban townships. Thus it has been reported that a third of Soweto householders suffered extensive interruptions of their water supplies and that 40% had sewerage overflows in their street which, in some cases, continued for months. These problems were attributed to water supply restrictions as well as to the general overloading of the system. They emphasise the importance of sound institutional, in addition to physical, coverage.

4. CURRENT INSTITUTIONAL SITUATION

4.1 Introduction

The institutional framework within which water supply and sanitation services are provided reflects the current fragmentation of government in South Africa with no single agency at national level charged with ensuring that all households are adequately served. In this, the situation is different from that of electricity where ESKOM has a clear mandate to promote and plan electricity supply to most of South Africa, albeit through the agency of regional distributors in some of the homelands.

The situation in the sector is further complicated by the division of responsibilities for water supply and sanitation, particularly when the latter is provided by means of low-cost, on-site systems. In this context, it is important to identify the role of the main agencies involved at each level.

4.2 National

The Department of Water Affairs, the custodian of the nation's water resources, is responsible for ensuring the availability and supply of water at a national level. Except for the promotion of water boards of regional scope (see 4.3 below), it has no direct responsibility for potable water supply beyond ensuring that bulk supplies of raw water are available.

The Department of Planning and Provincial Affairs is responsible for, amongst other things, promoting the orderly urbanisation and social development of black South Africans and promoting the establishment of local government within which the provision of effective services is an important consideration.

The Department of National Health has duties which include health planning, promotion of sound health practices and of environmental health; it has responsibility for monitoring water supply and sanitation services and the powers to take remedial action where necessary in the interests of public health. Its scope for intervention is in practice limited by budgetary considerations since it is supposed to recover costs incurred from local authorities which may not be in a position to pay.

The Department of Development Aid (DDA) and Development Bank of Southern Africa (DBSA) are both charged, inter alia with the responsibility for financing and promoting service provision to the black communities in the "self-governing territories" (DDA) and throughout South Africa (DBSA). DDA has an explicit mandate to provide technical assistance and services while DBSA's mandate is restricted to the promotion of economic development through investment funding, technical assistance and policy advice.

4.3 Regional

At a regional level, a number of different agencies can be identified with direct responsibilities in the sector.

Homeland government agencies usually of Agriculture, Public Works or Water Affairs have a clear mandate to provide water supply to the majority of the population who live outside proclaimed towns. Responsibility for sanitation lies with Departments of Health to promote appropriate provision except in the case of sewerage systems.

In "white " South Africa, two separate institutions can be identified, the Water Board and the Regional Services Council (RSC). **Water Boards** offer a mechanism for developing bulk water supplies and waste water treatment systems to meet all the consumption needs of a region. 13 boards, (including the Rand Water Board) have been established in areas of South Africa where a need was identified for a coordinated approach to water supply management beyond local authority boundaries.

Apart from their limited geographical scope, two restrictions on their potential contribution to community water supply needs are the requirement that their tariffs should cover costs, without profit (which implies that services should be provided only to paying consumers) and that they should normally supply local authorities rather than individual domestic consumers. This limits their ability to provide services to poor communities without effective local government.

Umgeni Water in Natal has taken a pioneering role in attempting to serve the needs of the entire population of its supply area. It is constrained in this both by the statutory limitations on its operations and by the lack of resources available to the communities themselves. It is also not evident that other water boards could fulfil a similar role in their supply areas.

Regional Services Councils' (RSC) operations vary considerably across the country. Initially promoted as agencies to provide bulk services to local authorities within metropolitan areas, their scope of operation is potentially far wider. Some RSCs cover large rural areas in which there are few clear benefits of a "joint services" approach but many opportunities to support service provision to rural communities.

Current suggestions that the RSCs broader regional role could be expanded under a new local government dispensation are thus of interest given the legislative provision for rural local government in the RSC Act. The constitution of the RSCs has been based on racially divided local government structures. They have thus shared the legitimacy problems of black local authorities.

The **Provincial Administrations** should have a limited role in the sector and operate mainly in support of local authorities and as financial intermediaries between national government and local government. In fact, they have been major actors as the providers of serviced stands for low income urban communities outside the boundaries of existing local authorities.

4.4 Local Government

The institutional responsibility at **Urban** local government level for service provision is relatively clear with formally constituted local authorities charged with these tasks. The fact that urban local authorities follow racial lines has meant that in black areas, they are widely regarded as illegitimate and unrepresentative of the communities which they are supposed to serve. This is currently a major focus of political conflict and has resulted in the disbanding of local councils and the appointment of external administrators.

Rural institutions at local level are weak throughout South Africa. In the homelands, the basic unit is the tribal authority which is supposed to provide administration and services although often with only minimal resources.

A gap exists at local level for the larger settlements in so-called rural areas. In many areas, the tribal authorities have long ceased to have legitimacy; even where this is not the case, they are seldom equipped to perform the complex tasks required of them. There are moves in the homelands to establish more appropriate rural authorities which could be more responsive to these needs. In white South Africa, similar problems are faced in squatter occupied areas outside the boundaries of existing local authorities. The emergence of civic associations in these communities is an attempt to provide the local government which is missing.

5. CONCLUSION

The institutional setting within which water supply and sanitation provision is made has three characteristics which are important for understanding the future institutional needs:

- it is fragmented, with a wide variety of different agencies acting at each level;
- the communities in which the needs are greatest are those with the weakest institutional structures; and,
- the institutional setting is likely to undergo significant change in the context of any new political dispensation.

WORKSHOP : STRATEGIES FOR

WATER SUPPLY AND SANITATION PROVISION

Future Institutional Issues and Approaches

1. INTRODUCTION

This paper follows the approach taken in the associated paper on the current institutional structure in the sector. It investigates sectoral organisation and institutions at national, regional and local level and addresses separately, where appropriate, the problems of urban, rural and intermediate communities.

To do this it is however necessary to indicate the framework within which such future structures are analysed.

2. FRAMEWORK FOR ANALYSIS

2.1 Introduction

Any discussion of the future institutional arrangements must be based on an understanding of the broader environment within which they are going to be effected. For this purpose, certain assumptions have to be made.

For the water supply and sanitation sector, the key issues that will impact upon the institutional framework are:

- the constitutional nature of government;
- the degree of decentralisation of government;
- the priority attributed to service provision;
- the economic policy of government;
- the financial arrangements in place;
- available institutional, technical and financial resources.

2.2 Government and its Priorities

It is assumed for the purposes of this paper that there will, in the medium term, be a unitary South Africa with a government broadly representative of the population within the 1910 boundaries.

As such, it is assumed that the provision of services will be given a high priority albeit often in the broader context of housing provision. This is derived from the stated current positions of the main political players as well as from the indications already given in the previous papers about the scale of need within the country.

2.3 Structure of Administration

At national level, it is assumed that the existing "own affairs" administrations and the components of the homeland states with national connotations (notably defence and foreign affairs) will disappear. There is no clear indication as yet of the structure of a future administration at national level and it is thus assumed that most functions will continue to be managed by departments along the present functional lines.

Some degree of decentralisation of functions can however be anticipated. Both the present government and the main extra-parliamentary groups agree on this; differences are found mainly on the degree of regional autonomy, the regional boundaries and the interaction between national, regional and local administration.

At local level, there is more clarity about the direction of future policy. In order to deal equitably with the current inequalities of capacity and resources, some model of metropolitan administration will be in force in the major conurbations although the nature of its constituent components has yet to be defined. In smaller towns, some form of non-racial administrative structures will probably be established in most cases.

2.4 Fiscal Arrangements and Economic Policy

The distribution of financial resources between the central fiscus, regional and local administrations and the control of these resources is a key issue in the constitutional debate.

Although some growth will occur, it is assumed that the total resources available to government will not increase dramatically unless there is a radical improvement in the economy. There is however likely to be a continuation of the current process of reallocation of funds within the Budget to both the formal social services (education, health, pensions and social welfare) and housing and physical services in black communities.

This is likely to occur within the framework of an economic policy which will use such reallocation both to stimulate the economy and to change its basic orientation.

2.5 Institutional, Technical and Financial Resources

It is assumed that the industrial base and technical skills currently available in South Africa will be maintained although it may be found that there are bottlenecks with respect to the middle levels of technical manpower.

The availability of funds for "development" expenditure may be increased by a return to the prescribed asset approach or by increased voluntary allocations from the private sector. The cost of such funds is however likely to remain high unless low yields are also prescribed.

There will be increased availability of funds for capital investment from overseas sources. Due to the (relative) wealth of South Africa, it is however unlikely that these will be on the highly concessionary terms available to our neighbours. Their cost may well be aggravated by the continuing decline in the relative value of the rand.

3. PRINCIPAL ISSUES TO BE ADDRESSED

Against the broad framework described in the previous section, the principal issues confronting the water supply and sanitation sector can be categorised as follows:

3.1 National Level

3.1.1 National Priorities and the Absence of Goals and Strategies

Until the recent publication by the ANC of its draft charter of human rights, no South African agency or political organisation was specifically committed to ensuring that all South Africans had access to adequate water supply and sanitation services.

(The relevant section of the document states that "The State shall take steps to ensure that energy, access to clean water and appropriate sewage and waste disposal are available to every home".)

Inclusion of specific reference to water supply and sanitation provision in a constitutional context is indicative of how political developments are likely to place new emphasis on the goal. There is thus an urgent need for a coherent strategy to respond to it.

3.1.2 Institutional Complexity and Coverage

Responsibilities for the water and sanitation sector at national level are fragmented. No single agency is responsible at an oversight level for the provision of water supply and sanitation to all South Africans. As currently structured, this responsibility falls between a number of different departments of government which increases the likelihood that some groups will "fall through the net".

3.1.3 Financial Issues

Given the extent of need already identified in the previous papers and the fact that this need occurs mainly in communities with very few financial resources available to them, financial issues are likely to be central to any long term strategy.

In this context, it is important to distinguish between direct capital expenses, the system operating and maintenance costs and the "programme costs" which will of necessity be incurred by any agency which promotes the development of both physical and institutional systems in this field.

3.1.4 Urban / Rural bias and Settlement Patterns

In most developing countries, a difficulty frequently confronted in many sectors is the establishment of an appropriate balance between support for the urban and rural sectors. In a South African situation, this is complicated by the fact that the institutions in black rural areas have historically been different from those in the rest of the country.

The current situation is also anomalous in that the homeland institutions, which have the clearest mandate to provide services, have access to fewest resources.

Perhaps the most difficult issue is however the effect of the distortions that have been imposed upon settlement patterns in the past. These have left many communities without a viable economic base.

Large communities are settled in rural areas but sustained by wage earners in distant urban areas rather than by any agricultural activity for which there is invariably insufficient land. Settlements have grown haphazardly with little economic logic, although each family acts rationally to reduce its domestic costs to a minimum and is encouraged in this by tribal authorities, whose financial base and patronage is expanded by newcomers.

Servicing such "displaced urban" communities is extremely costly because of their geographical spread. To sustain them could permanently build gross inefficiencies into the economy. There is thus a clear need for a coherent development framework with respect to these areas. This falls outside the immediate scope of professionals in the water and sanitation sector but highlights the institutional problems which they confront.

3.2 Regional level issues

3.2.1 Physical and Functional Scope of Regional Institutions

There are a number of alternative approaches which could be taken at a regional level. Regional institutions may operate within the areas of jurisdiction of future regional government or within functional sector-specific boundaries.

Sectoral activities which need to be addressed at a regional level may include:

- management of the quality and quantity of the water resource;
- provision of bulk services;
- monitoring and supervision of the technical and financial performance of local agencies;
- direct administration and/or provision of services in small, scattered communities.

Decisions need to be taken on the attribution of responsibilities for these different activities.

3.2.2 Sectoral Versus Local Government Models

One issue on which there has already been some debate is whether service provision at regional level should be managed on a functional (sectoral) or administrative (local government) basis.

The two models which can be counterposed in this context are those of the water board (or other form of regional water authority) as against the regional services council.

At the moment, both models exist in South Africa. Water Boards have been established in some of those areas where there is a clear technical requirement for coordination of water supply activities beyond the boundaries of local authorities.

In parallel, Regional Services Councils have been established in many areas with powers to undertake the provision of bulk services (including water supply and sewage disposal) although the extent to which the RSCs have in fact opted to assume this responsibility is extremely variable.

3.2.3 Resource and Catchment Management versus Bulk Supply

A regional sectoral organisation may be limited in its function to the provision of bulk supplies of potable water, additionally, for bulk sewerage and wastewater disposal or it may take responsibility for the management of the water resources in a region. There are good theoretical grounds for separation of some of these functions, particularly in the area of quality where it might be inappropriate for the same institution to be responsible for both the disposal of effluent and the monitoring of compliance with standards and regulations.

Similarly, in the financial context, the pricing of bulk raw water supplies may be more appropriately carried out at arms length from the major consumer to avoid distortions due to cross subsidisation and also to allow economic decisions about allocations to other users.

Lastly, there may be cases where the boundaries within which the water resource is managed are very different to those within which water supply and sewage disposal services are rendered.

3.2.4 Service Provision in Poor Non-urban Communities

It is anticipated that a major problem area will be in the provision of services to the large populations in rural or semi-rural areas in the current "national states".

These communities in many cases lack capable local government institutions. This is compounded by the absence of both the financial resources and the technical resources to provide adequately for themselves. For this reason, the needs of these communities will initially have to be addressed at regional level since this level will be charged with the responsibility of establishing the appropriate local capacities. There are major organisational implications however of attributing responsibility for the management of reticulated services to regional institutions.

3.3 Local Level Issues

3.3.1 Cost Structures

At an urban level the historical imbalances between the different communities have meant that, under present structures, the poorer sectors of the community have to pay more for equivalent services. This is because the marginal cost of new schemes is invariably higher than that of older ones. Further, the existing local government structure excludes residential services in black communities from the benefits of scale of supply to bulk consumers in industry and commerce which has provided some effective cross-subsidisation to the white areas.

3.3.2 Technical Issues

It is important that the sector institutions promote appropriate technical approaches to service provision. Different technical approaches however require different types of institutions. In many cases, the institutions serving one technical approach (for instance water borne sewerage) are well developed while those offering an alternative (say improved pit latrines) are virtually nonexistent. In this environment, it is unlikely that appropriate technical choices will be made.

Some assessment is thus needed of whether the specific institutional needs of different communities are in fact catered for.

The under-served communities are in general not the areas of choice for technical professionals. A further problem is thus that the areas with the most difficult problems are least able to attract the calibre of technical staff needed to help resolve them.

3.3.3 Role of NGOs

At a local level, non-governmental organisations (NGOs) are often important in the provision of services, especially in poor, rural communities. This work is important in that it often provides useful experience of different approaches to service provision. It can also involve communities more actively. There are however clear limitations on the resources available for this kind of work. The single project focus may also detract from the economies of scale which can be achieved by larger **programmes** which may use the same approaches but are able, through the training of lower level technical staff and the provision of logistical support, to do so far more cost-effectively. In this context, the work of NGOs is often most valuable at a pilot project stage.

3.4 Financial Issues

The financial requirements to meet the backlog in services (presented elsewhere) are immense. These costs are determined essentially by two factors, the nature of the settlements served and the levels of service provided.

The problem of inappropriate settlement patterns have been mentioned in 3.1.4 above. At local level, it is important to note that a local institution will seldom be in a position to make judgements about what is essentially a regional issue.

The levels of service provided are to some extent determined by institutional considerations. The objective should be to have institutions with an understanding of the range of alternatives available, structured to ensure that the right alternative is used in the right context.

There is currently a variety of financial sources available for service provision including traditional agencies such as the Local Authorities Loans Fund and the capital market as well as the Regional Services Councils and DBSA. Funds from these sources are usually provided on a loan basis however which is often not affordable in the poorer communities. While some government funds are available through, for instance, the Departments of Planning and Provincial Affairs and Development Aid, the potential for direct budgetary support (as well as charitable assistance from non-governmental organisations) is extremely limited, when set against the scale of the needs.

More recently, other organisations (such as the Independent Development Trust) have focused their efforts on channelling finance for "site and service" type schemes. Mechanisms have also been proposed by which further funds could be mobilised from the private sector. It is likely that financial provision of this kind will dominate the provision of services in urban areas.

Often however service levels (and thus service costs) are being determined by financial agencies rather than by the technical agencies which will have to operate and maintain the infrastructure systems proposed. There is also only limited involvement (and therefore consent) on the part of the communities to be served. There is thus a danger that inappropriate levels of service will be provided with repercussions for the financial viability of these services in future years. These proposals have also not taken full account of bulk service requirements since they have been focused at a local authority, rather than regional level.

4. POSSIBLE NEW APPROACHES

4.1 National

There is a precedent in some African countries for the national Department of Water Affairs to include within its brief the global responsibility for water supply and sanitation. In this model, the Department of Health performs a monitoring role while a Department of Local Government may play a limited role in promoting sound institutional and financial arrangements in local administration.

In South Africa's case, this simplistic structure is less likely to be appropriate given the existing decentralisation; the desire to maintain this is based on the perception that there is limited need for central management of the sector.

There is however a clear need for coordination between national government departments and organs of regional and local government. This coordination should have as its objective to ensure that :

- no communities "fall through the institutional net";
- the approach to achieving the goal of coverage for all is coherent and coordinated between the different actors;
- available funds are allocated and used on a fair and cost-effective basis.

The mechanism for attaining this coordination which has been used in other countries has been a high level inter-DepartmentalCoordinating Committee. At the present juncture in South Africa, it might be desirable for the core membership of such a committee to include representation from extra-governmental organisations as well as to allow for the co-option of specialist members.

4.2 Regional

At a local level, the approach of establishing single local authorities with a common revenue base charged with the provision of services throughout coherently defined urban areas - the "one-city" approach - has been widely accepted.

For rural and "displaced urban" communities similar benefits of scale, access to financial resources and optimal allocation of technical resources can probably only be obtained through regional level institutions.

The approach currently being taken by Umgeni Water which is attempting to generate a coherent approach to service provision to all residents of its supply area is of interest. Its applicability is however limited to those areas in which a Water Board has been established or in which the Water Board approach is appropriate.

The model of a Regional Water Authority is currently being developed in Bophuthatswana where a water authority has been created to manage the many relatively small water supply and sewerage installations in the territory. Here there are few obvious grounds for centralised management beyond the need to ensure the optimal use of scarce technical resources and the limited ability of local communities to manage their own systems.

The application of such approaches is also a function of decisions about the relative merits of the local government oriented approach versus the sectorially based one. There are sound arguments for both approaches:

The sector specific approach is favoured because:

- it is a rational way to manage a resource which crosses administrative boundaries;
- it generates economies of scale and of specialisation, due to the focus on a single function;
- it removes the provision of water and sewerage services from the political arena.

The local government model is supported because:

- it operates within a framework which promotes political accountability to the consumer community;
- because of its accountability, it is potentially more efficient in its operations;
- there are synergies in operation between sector activities and other functions (for instance, electricity supply, metering and billing);

In a South African context, the particular advantages and disadvantages have to be weighed against each other. It should however be noted that the arguments about accountability may be applicable on a local government level but may carry less weight at the more distant regional government level.

Regional Government of some sort will inevitably be proposed in the context of the present constitutional negotiations. While the Regional Services Councils have been tainted as racially based institutions, a similar body charged with providing services over a predominantly rural region could be extremely effective. Both government and ANC are committed to a regional government approach. The details of such a system will however be contentious. For this reason, a sectorially based approach may, in the medium term, be more likely to succeed.

4.3 Local Approaches

At an **urban** level, the "one city" approach has the potential to overcome many of the institutional problems which are faced with regards to service provision in the towns. It ensures the optimum use of existing technical capacity over the whole population. Uniform tariff approaches will avoid burdening with higher tariffs the newer consumers who do not benefit from the historically cheaper investments serving existing consumers or from cost sharing with large consumers.

In the broader **rural, peri-urban and "displaced urban"** communities, approaches in which technical support is given to communities to help them provide their own services have been widely practiced elsewhere in Africa and may be appropriate in smaller settlements. Such approaches are often seen as an integral part of the process of developing effective local government institutions.

Responses also have to be developed which take account of the constraints imposed by the spatial environment within which water and sanitation goals have to be met. There are many inefficiencies within this environment which it is not desirable to maintain, much less to reinforce.

There will thus be many instances in which a community has a clear need for a water supply but for which funding agencies are reluctant to support any scheme with scope for expansion and a long service life. It might be more appropriate in such instances to provide only a minimum "survival" service. Communities where small scale supplies of this sort are not feasible may even have to be left unserved.

This kind of decision should not be the responsibility of sector institutions. They will however come under pressure to provide services unless clear guidance is given from other institutions of government as to how the needs of these communities should be handled. It will be important for the sector institutions to take a pro-active stance in highlighting these problems to avoid accusations of failure to provide services in environments in which such provision cannot be justified.

4.4 Financial Approaches

Sources of finance will be important determinants of the way in which the water supply and sanitation goals are met. Some of the deficiencies of current proposals for meeting service needs have been noted in 3.4. This must not however detract from the major achievement – the development of an institutional structure with the potential to solve the financial problems of urban service provision. There is however a need to ensure that the financial interventions support coherent institutional strategies. If this is not done, the services provided will not be sustainable in the longer term.

The major gap is now the identification of an appropriate approach for funding service provision in rural areas.

5. CONCLUSIONS

From the discussion above, some tentative conclusions can be drawn.

5.1 National

There is a need at national level for an appropriate forum to be established for coordination of policies and strategies in water supply and sanitation with the aim of ensuring that:

i) all communities are adequately served by appropriate institutions;

ii) an appropriate mix of technologies and service levels is supported by sector institutions;

iii) resources are allocated between communities and institutions in support of coherent strategy and without bias in favour of one or other institutional provider.

5.2 Regional

There is an urgent need to review the alternative institutional means to provide support to the currently underserved rural and displaced urban communities in a way which optimises technical and financial resources.

The pros and cons of the Water Board versus the Regional Service Council versus regional government responsibility for water supply and sanitation at regional level need to be clarified in the context of the above review.

The identification of communities in which, by virtue of their artificiality and lack of economic base, large infrastructure investments should not be made is an urgent priority for the sector. This may require active interaction in the broader planning process by sector institutions.

?
Yes, but...

5.3 Local

5.3.1 Urban Serviced Site Approach

In an urban context, the "one city" approach to the financing and management of services together with the proposal to support the provision of serviced sites for housing development is likely to provide a framework within which many of the needs can be met. Care must be taken to ensure that levels of service are provided which are sustainable in the future.

While the technical nature of water supply activities in urban areas is likely to remain relatively unchanged, the provision of sanitation, particularly of acceptable on-site sanitation technologies, will require changes in the organisation of services. On-site sanitation may best be supported by sectoral programmes to promote the construction of technically appropriate units as well as health and user education.

5.3.2 Rural and displaced urban communities

The main institutional challenges to be faced will be in areas where there is currently no effective institutional provision. In rural, areas including the "displaced urban" communities, there is as yet no clear institutional model which will serve the needs of the currently unserved population.

Because of the dearth of local resources, the key to resolving this problem is likely to be found at the regional rather than at the local level, as indicated above.

There is a need for approaches similar to the "one-city" approach to be developed for the rural and peri-urban areas which aim to use regionally available technical and institutional resources within a financially viable framework.

WORKSHOP : STRATEGIES FOR WATER SUPPLY AND SANITATION PROVISION

Future Trends and Issues

1. INTRODUCTION

Using the data collated and reviewed in the previous papers on the situation in urban and rural areas with respect to water supply and sanitation, an attempt is made in this paper to establish future trends in service coverage and cost of provision of services on the basis of current practice.

These trends are evaluated in the light of our knowledge of the financial resources of government and of communities themselves and alternative strategies are reviewed in the light of financial constraints and the uncertainties in the broader social and political environment. In conclusion, achievable targets are indicated and approaches that may prove to be more sustainable are presented.

2. BASELINE ASSUMPTIONS

2.1 Demographics

The estimated population and projections used in this paper, and related sources, are based on those produced by the Urban Foundation in its "Policies for a New Urban Future" series. The 1991 Census figures will provide an opportunity to review the estimates but will not, unfortunately, contain any data on water supply and sanitation coverage.

The coarse division between rural and urban is somewhat problematic because some areas classified as rural display certain urban characteristics and vice versa. In particular, dense settlements resulting from resettlement or "betterment" policies may be arranged spatially like urban areas but lack the institutional and economic base to support them. Furthermore, these areas may well be experiencing zero growth or even rapid out-migration, which increases the difficulties of planning for water supplies.

2.2 Current Levels of Service

The current levels of service used in this paper are those reported in the related papers reviewing the status quo in both rural and urban areas. The authors of these papers reported enormous difficulties in gathering data on coverage. (It is hoped that one outcome of this workshop will be a concerted effort to co-ordinate information gathering in order to develop a national database for the sector.)

In reviewing the current levels of service, a value judgement as to what can be considered an "adequate" level of service is made. This is based primarily on health considerations rather than convenience or political grounds. The following criteria have been used to determine which existing systems need improvement.

In rural areas: an adequate water supply would be "reasonable access to a point source of potable water" (e.g. 20 lcd at a maximum distance of 500 metres). Adequate sanitation would be one improved latrine (VIP - ventilated, improved pit - or similar) per household. Unimproved pit latrines would be considered inadequate.

In urban areas: reasonable access to potable water would probably mean a shorter distance, say 250 metres, and may in fact, be governed by the number of households per outlet, with a maximum of, say, 100 households. Adequate sanitation would be one VIP per household. From a public health viewpoint, unimproved pits, bucket latrines and communal toilets of any kind are considered inadequate.

2.3 Current Unit Costs and Subsidies

Current costs derived from the previous papers are presented in Table 1. The range of unit costs is quite large so an approximate average has been used for projection purposes. Of particular note are the estimates of running costs and the present levels of subsidy. These subsidies, when projected into the future, demonstrate the recurrent cost implications of the level of service chosen and its implications for the sustainability of services.

The sector receives a range of subsidies, both hidden and explicit, and some unintended. Capital costs are met by a mix of full grant, partial grant, soft loan, annual departmental budgets and NGO charity operations. Running costs are supplemented by central government subventions, so-called"bridging finance" (a sad misnomer), local government subventions and/or inefficiency and cross-subsidisation.. It has proved difficult to identify all of these and there would appear to be a strong case for identifying and reviewing all subsidy elements to permit calculations of cost to be conducted within a unified structure.

2.4 Current Trends in Service Levels

The current policies for supplying services are detailed elsewhere, together with notes on gaps in present policies. It had also been intended to estimate current rates at which improvements are being implemented in order to identify constraints in implementation capacity. In the event, this has not been possible, in part due to the considerable uncertainty about future institutional structures and sources of finance. Some indicative rates have, however, been estimated based on assumptions regarding the rate of spending.

The limitations in the capacity of the sector institutions to operate and maintain a large number of systems, particularly in developing areas have long been recognised. It is considered unlikely that O & M costs will be lower than at present for existing systems, regardless of the management strategies adopted in the future.

3. TIME AND COST PROJECTIONS

3.1 Overall Cost Projection

From the details of existing coverage and levels of service, it is possible to identify the population which is not yet adequately served. The cost of serving this population to existing standards (i.e. to the level preferred by current policies) can then be calculated using current unit rates. (See Table 1).

The total capital investment required is estimated to be nearly R28 billion.

over 10 years?

3.2 Urban Costs

In the urban areas, the SAHAC/IDT Capital Subsidy proposals are by far the most significant initiative. These proposals envisage at least one million one-off capital subsidies to be made to low income families. Each subsidy is worth, at present, R7 500, of which up to R3 500 would be for water supply and sewerage. This could make available R3,5 billion - if the financial provision is secured. A similar sum would however need to be raised to cover the costs of associated bulk infrastructure

?? 100 000 !!

3.3 Rural Costs

There is no similar provision for water supply and sanitation in rural areas. This tends to be the responsibility of cash-starved homeland governments. Given the lack of direct economic benefit from improving water supply and sanitation in the

under-developed rural areas of South Africa it seems hard to justify the investment of R10 billion. Nevertheless, certain political commitments have been made, frequently in the contentious context of "resettlement", or "betterment", and some ongoing action is required.

3.4 Operating and Maintenance (O & M) Costs and Subsidies

In addition to capital costs, it is possible to estimate the subsidies which are currently applied to recurrent expenditure. These subsidies are found in a variety of guises e.g. budgetary allocations for the operation of regional rural water schemes, administratively determined (R293) tariffs in SADT areas and homelands, under-paymentof water and sewerage costs in the "rent" collected (or not collected) in townships. When projected into the future, it can be demonstrated that enormous subsidies would be required to continue the application of current policies to the whole population.

The future subsidy on recurrent expenditure is estimated at <u>R1.6 billion per annum</u> for the foreseeable future.

The magnitude of this ongoing subsidy of recurrent costs highlights the need for caution about the levels of service to be provided, particularly to low income households. Although some of the capital costs would be met from funds earmarked for "housing", the ongoing subsidy would effectively be a subsidy for water consumed (and wasted) and sewage discharged.

Doubt has thus been raised about the advisability of providing sewerage for low-income households. In urban areas, the income levels of the low-income households to be housed under the capital subsidy scheme do not allow for large contributions to water supply and sewerage. It is estimated that R30-40 per month would be needed to pay for water and sewerage by a typical household connected to the mains sewer (in addition to water used for drinking, cooking and washing).

The present high level of default in payment of services, even after the negotiated settlements of some of the "rent" boycotts, suggests that economic service charges are beyond the means of many. In the current political climate however, there is a danger that subsidies intended for the very poor may be built into the structure of services on a permanent basis.

There is a need for a careful review of current policies before committing the national economy to such ongoing subsidies especially since the level of service proposed is one which is far in excess of what is required for reasons of public health or benefit to the economy.

Similarly, in rural areas, the trend to construct large regional water schemes is expensive in both capital <u>and</u> recurrent costs. Given the considerable difficulties in effecting cost recovery in such schemes, the local contribution tends to be a token contribution toward capital costs after which all consumption is subsidised, and usually uncontrolled. Under such circumstances it is not surprising that operations and maintenance are frequently inadequate.

3.5 Time Projections

The present rate of implementation of rural water schemes is far from adequate, and rural sanitation programmes have hardly been considered – with one or two notable exceptions. If the present rate continues unchanged then it could take 20 – 30 years for an improved water supply to reach the majority (say 80%) of rural inhabitants.

In an urban context, if it is assumed that most of the improvements in coverage will come about under the SAHAC/IDT proposals, progress will be slow. If as much as R1 billion is made available annually for housing (with half for water and sewerage), and another R500 million annually for bulk infrastructure, it will still take at least 10 – 15 years to achieve the goal of adequate service coverage in urban areas.

4. REVIEW OF PRIORITIES

4.1 Priorities

Assuming the above projections are unacceptable – to both water sector professionals and to the financial authorities – present policies for water supply and sanitation must be reconsidered. In particular, our priorities for improvements in the sector must be determined.

The process of reviewing policies and targets in order to prepare realistic and sustainable programmes was a common experience of the international community, and especially developing countries, when they committed themselves to the aims of the International Drinking Water Supply and Sanitation Decade. South Africa now has the opportunity to learn from the experiences of others in the Water Decade and, hopefully, to avoid repeating the mistakes that were made.

Improvements to water supply and sanitation are frequently a high priority for consumers and governments alike. For the consumer, convenience and health benefits are important; in addition, governments perceive the economic benefits of improved health and reduced time spent obtaining such services. It must be remembered that the highest level of service is not required in order to convey health benefits, hence the definition of "adequate" at the beginning of this paper.

Apart from rational economic and public health arguments, current political imperatives must also be taken into account. Aspirations are high, large sections of the population have been led to believe their quality of life will rapidly improve, and there is a strong feeling that past inequalities must somehow be redressed. There is undoubtedly a need to demonstrate progress, but future investments must be in line with a sustainable approach (see below). If not, the risk is that progress will come to a halt causing further, perhaps worse, frustration.

The priority should be to set achievable targets, aiming at a level of service which is sustainable for the whole population, laying the foundation for further improvements as and when the economy improves.

4.2 Financial Realities

The financial realities of the sector need to be laid bare. Government finances will be severely strained while redressing other inequalities over the next few years, notably in other social services such as education and health care. Personal finances will be more heavily taxed to pay for this and there will be less disposable income to spend on increased convenience. Both of these sources of finance depend on a healthy economy which South Africa may not achieve for a considerable time. External borrowing for public services is a dubious proposition, particularly if such loans cannot be serviced by revenue generated from the services themselves. In any event, whatever borrowing takes place it must be on the basis of full cost recovery so as to avoid becoming another drain on the fiscus.

To achieve a sustainable investment programme, it is necessary to understand the cost structure of the sector. Financial performance criteria for water and sanitation suppliers need to be established and subsidies on running costs reduced to an absolute minimum. Both capital cost and recurrent cost subsidies should then be carefully targeted to achieve maximum effect. Cost recovery should be on the basis of marginal, or incremental, costs to ensure adequate provision for ongoing improvements and for operations and maintenance.

On the basis of such a clear "minimum subsidy" policy a better understanding could be gained of what clients are willing and able to pay for. As distortions are removed, both consumers and suppliers will be able to make more rational investment decisions. Where the demands of public health are in conflict with the consumer's ability to pay, financial packages could be structured with a mix of grant finance (meeting basic needs) and loans (for increased convenience).

4.3 The Changing Environment

South African society is in a high state of flux. Rapid changes are expected: politically, demographically and economically (for better or worse). Homeland structures and black local authorities will probably disappear or be substantially modified. Rural areas are subject to substantial out-migration and urban areas continue to experience rapid population growth. Informal settlements and squatter areas will grow rather than disappear.

Water supplies are suffering from dwindling resources, forcing moves to ever more expensive sources (e.g. the Lesotho Highlands). More problems are being caused by degradation of the ecological environment including both surface water and groundwater. These pose further technical, social and financial challenges. Furthermore, there is a dearth of skilled manpower. There is a continuing need for more training at all levels in the industry.

Demographic and socio-economic uncertainties make it expedient to avoid overplanning and investing for some ambitious ultimate solution. It is better to understand improvements in the sector as an ongoing process; a series of incremental steps, made with the involvement of client communities to ensure the best use of limited resources. On the other hand, rapid urbanisation and proposed mass housing schemes could put considerable strain on bulk infrastructure which sometimes has relatively long lead times.

In the face of such potential changes, it is not possible to develop a detailed blueprint for the sector; plans must be founded on agreed basic principles, starting with the financial policies proposed above, and recognising the importance of service provision as a broad social goal and of involving the communities as a means to achieve it.

Ultimately, success in achieving widespread coverage will depend on setting up a structured process of improvement within the means of the national economy.

5. ACHIEVABLE TARGETS AND SUSTAINABLE APPROACHES

Table 2 is a first attempt to propose a mix of levels of service which would be affordable to both the individual consumer and to a national Government. The levels of service are more modest (requiring capital investment of R11 billion) and have a much lower recurrent cost implication (R600 million annually).

5.1 Rural Areas

There is a clear need for our approaches in rural areas to move towards supporting community-based initiatives which would in many cases lead to smaller, more cost-effective schemes with communities directly involved in operations and maintenance.

The rural water supply approach proposed thus envisages considerably more reliance on handpumps in preference to regional/centralised schemes. There would also be an acceptance of protected traditional sources, either springs or wells. Such upgrading would ensure an improved source as a first stage, leaving other improvements in convenience to some later date.

Rural sanitation would rely more on self-built VIP latrines assisted through the primary health care network and trained local builders. Both the above approaches would benefit significantly from health and hygiene education aimed at motivating communities to improve their own facilities and use them to better effect.

5.2 Urban Areas

In urban areas, a "minimum subsidy" policy might result in a switch from free public standposts to water-vending, in whatever form is suitable for a particular area. Sanitation would include an emphasis on VIP latrines or aqua-privies, or both. Waterborne sewerage would be provided only for those who could afford the full running costs. Some of the large numbers of bucket latrines could be converted to waterborne systems and some to VIP latrines depending on affordability and community choice - in the context of minimum subsidies.

5.3 Rate of Implementation

It is still necessary to determine a rate of implementation that is achievable while meeting the political and socio-economic objectives of, for instance, rapid visible improvements, swift creation of serviced sites in urban areas, inward industrialisation, integration with national housing policy, and an emphasis on self-help. Likewise, the sustainability of the proposed rate of implementation in terms of its capital and recurrent cost requirements needs to be checked.

6. CONCLUSIONS

This paper, and the others prepared for this workshop, serve as indicators of how much needs to be done in the water and sanitation sector in South Africa. Although our existing knowledge is so fragmentary that we do not know the present state of coverage, we do know that a large number of people are inadequately served. In many respects, the sector lacks clear policy direction. Technology choice, delivery systems and operational systems for low income groups are poorly developed, and financial policies are in serious disarray.

More cost-effective strategies are feasible.
As this paper indicates, projected capital costs and ongoing subsidies could be reduced by as much as 60%.

A sector-wide initiative is needed to address these issues in a co-ordinated manner. Those agencies actively involved in water supply and sanitation need to develop co-ordinated policies, unified cost structures (not necessarily uniform), and achievable investment programmes. Our policies should aim to involve communities, develop people, protect the environment, and place the sector on a sound financial footing.

It is only on this basis that we can hope to meet our social, political and economic objectives within the sector.

*** WS2000 WORKSHOP ***

*** TABLE 1 ***
*** PROJECTIONS - based (approx.) on current policies ***

REGION & Service	PRESENT L.O.S.	POPn. (millions) 1990 AD	POPn. (millions) 2000 AD	FUTURE L.O.S.	UNIT RATES Cap. (/cap)	UNIT RATES Sub. (pa)	CAPITAL COST	PROBABLE SUBSIDY (pa)
RURAL Water	traditional	4.00	5.00	cent.	650	20	3,250	100
	protected	4.00	4.00	cent.	650	20	2,600	80
	handpumps	2.00	2.00	cent.	650	20	1,300	40
	local	4.00	4.00	cent.	650	20	2,600	80
	centralised	2.00	2.00	cent.	n/c	20	0	40
		16.00	17.00 ?*				9,750	340
RURAL San.	nothing	14.00	14.00	VIP	150	5	2,100	70
	pits	2.00	2.00	VIP	150	5	300	10
	VIP's etc		1.00	VIP	n/c	5	0	5
		16.00	17.00 *				2,400	85
URBAN Water	minimal	3.95	7.25	free	130	13	943	94
	vendor	.50	.50	free	130	13	65	7
	free	1.60	4.00	yard	265	10	1,060	40
	yard	3.00	6.00	house	515	20	3,090	120
	house	13.25	13.25	house	n/c	20	0	265
		22.30	31.00				5,158	526
URBAN San.	minimal	5.00	5.00	aqua-p.	180	5	900	25
	minimal	1.75	9.60	w/borne	750	25	7,200	240
	buckets	.70	.70	w/borne	750	25	525	18
	pits	.60	.60	w/borne	750	25	450	15
	VIP	.20	.20	w/borne	750	25	150	5
	aqua-privies	.15	1.60	w/borne	750	25	1,200	40
	w/borne	13.90	13.30	w/borne	n/c	25	0	333
		22.30	31.00				10,425	675
TOTALS:		38.30	48.00 (millions)				27,733 (Millions of Rands)	1,626

Note: Popn. projection for 2000 AD. (UF)

NOTES: 1. Unit rates based on 6 persons/household urban and 7 rural.
2. Unit rates include capital required for bulk infrastructure.

WS2000 Group.

+ 3% annual growth → 21.5 million by 2000 AD.

Is pop really only going to grow by 0.007% per annum in rural areas?

Will all "surplus" pop move to cities?

*** TABLE 2 ***
*** PROJECTIONS - based on alternative policies ***

REGION & Service	PRESENT L.O.S.	POPn. (millions) 1990 AD	POPn. (millions) 2000 AD	FUTURE L.O.S.	UNIT RATES Cap. (/cap)	UNIT RATES Sub. (pa)	CAPITAL COST	PROBABLE SUBSIDY (pa)
RURAL	traditional	4.00	5.00	prot.	15	2	75	10
Water	protected	4.00	4.00	handp.	40	5	160	20
	handpumps	2.00	2.00	handp.	n/c	5	0	10
	local	2.00	2.00	local.	40	20	80	40
	local	2.00	2.00	cent.	650	20	1,300	40
	centralised	2.00	2.00	cent.	n/c	20	0	40
		16.00	17.00				1,615	160
RURAL	nothing	14.00	14.90	VIP	50	5	745	75
San.	pits	2.00	2.00	VIP	100	5	200	10
	VIP's etc	.10	.10	VIP	n/c	5	0	1
		16.10	17.00				945	85
URBAN	minimal	.55	8.95	vend.	100	10	895	90
Water	minimal	3.40	3.40	house	515		1,751	0
	vendor	.50	.50	vend.	n/c	10	0	5
	free	1.60	1.90	yard	265		504	0
	yard	2.30	2.30	yard	n/c		0	0
	yard	.70	.70	house	515		361	0
	house	13.25	13.25	house	n/c		0	0
		22.30	31.00				3,510	95
URBAN	minimal	3.75	12.45	VIP	170	5	2,117	62
San.	minimal	3.00	3.00	w/borne	750	10	2,250	30
	buckets	.30	.30	w/borne	750	10	225	3
	buckets	.40	.40	VIP	170	5	68	2
	pits	.60	.60	VIP	170	5	102	3
	VIP	.20	.20	VIP	n/c	5	0	1
	aqua-privies	.15	.15	w/borne	750	10	113	2
	w/borne	13.90	13.90	w/borne	n/c	10	0	139
		22.30	31.00				4,874	242
TOTALS:		38.40	48.00				10,944	581
			(millions)				(Millions of Rands)	

NOTES: 1. Unit rates based on 6 persons/household urban and 7 rural.
2. Unit rates include bulk infrastructure capital requirements.

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