

**DEPARTMENT OF WATER AFFAIRS
AND FORESTRY**

DRAFT POLICY



**WATER SUPPLY AND SANITATION
FOR DEVELOPING COMMUNITIES**

JULY 1991

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(SECOND REVISION)

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PREFACE

This document has been prepared in response to requests for the Department of Water Affairs and Forestry to indicate its position with regard to the provision of water supply and sanitation services to developing communities in South Africa. One request was received from the President's Council which, following a directive from the State President in November 1990, is investigating adaptations to the Government's Strategy on Urbanisation.

Another request has come from the Development Bank of Southern Africa in anticipation of the Water 2000 workshop on this subject to be held on 1 August 1991. In addition, the World Bank, which will be represented at this workshop, has expressed an interest in the role of the Department in the upliftment of developing communities.

As these requests addressed similar issues, it was felt that a single document, outlining the Department's standpoint on water supply and sanitation, should be produced.

The fundamental principles of the Department's water supply and sanitation policy for both rural and urban communities, are the same. There are, however, variations in implementation due to the differing characteristics of the two types of community.

This report outlines the Department's views, draft policy and functions with regard to the provision of water supply and sanitation services to developing communities. The term 'draft policy' has been used in order to afford maximum opportunity for debate on this important issue. This report is the second revision of the draft policy. The Department is indebted to those expert organisations which were requested to review the first revision and which replied with valuable and constructive comments. This second revision will now be submitted to a wider audience for comment.

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1.0 INTRODUCTION

1.1 GENERAL

The Department of Water Affairs and Forestry has expressed views on the supply and financing of water and sanitation for basic human needs in Chapters 6.16 and 6.6 of its report on the *Management of the Water Resources of the Republic of South Africa*. The following is an expansion of those views to cater for the rapidly changing conditions in developing rural and urban communities.

The Department recognises that access to adequate supplies of water of a suitable quality does not merely have an effect on the state of health of a population, but also affects development, productivity and overall economic growth. To date the role of the Department in the provision of water for human needs has focussed on the planning, development and operation of bulk water supply schemes. Generally, bulk water is supplied to either a water board or municipality, whereupon it is treated to an acceptable standard before being supplied to the consumer. In areas without a water board, the Department sometimes undertakes the treatment and supply of final water to municipalities and some other consumers. This is not a role which is considered commensurate with the Department's current primary task of managing the water resources of South Africa, although a greater involvement in this responsibility cannot be ruled out.

In combining water supply and sanitation issues in one policy document, the Department acknowledges the interdependence between these two essential services.

1.2 WATER SUPPLY

The Department has limited experience in providing water to developing communities. The emergence of national states and self-governing territories placed most of these communities outside the jurisdiction of the Department. The water supply needs of those communities which remained within the Republic of South Africa were largely dealt with by other Government agencies, such as the Department of Development Aid, provincial authorities and water boards.

Furthermore, the provision of basic services to the many informal or overcrowded communities which have developed since the removal of Influx Control, is currently being attended to by second and third tier local government. To control and encourage effective water resource development, the Department can subsidise and assist certain organisations in the development or improvement of water supply systems.

1.3 SANITATION AND WASTE DISPOSAL

The Department is not statutorily responsible for the provision of sanitation facilities. This is the function of other organisations. However, in view of its water quality management responsibility, the Department does concern itself with the adequacy of existing sanitation facilities and any proposals for new systems. For example, the Department may oppose the development of pit latrine or septic tank systems if nearby surface or ground water resources could be adversely affected. The Department can also grant financial subsidies for the development or upgrading of municipal wastewater treatment works.

In order to protect surface and ground water from becoming polluted, the Department controls the establishment and operation of waste disposal sites, including sanitary landfill sites.

1.4 THE DEPARTMENT'S POSITION REGARDING WATER SUPPLY AND SANITATION

The provision of water supply and sanitation services to developing communities is set to become a key issue in the management of the water resources of South Africa. The existing responsibilities of provincial, regional and local authorities preclude the automatic and direct involvement of the Department in individual water supply and sanitation schemes. However, it is a function of the Department to determine overall policy and to give guidance to other water agencies. Also, as the magnitude and complexity of the problem is likely to place demands on the resources of other water agencies, it is appropriate that the Department identifies areas where its expertise can make a worthwhile contribution to the provision of these essential services.

It must be stressed that in drafting this document, the Department is not necessarily gearing itself for new low level responsibilities. It is however aiming to establish a suitable climate in which these responsibilities can be executed timeously, efficiently and consistently by the

appropriate bodies.

1.5 REPORT STRUCTURE

The remainder of this report comprises two parts.

Part A addresses the policies and views of the Department regarding water supply and sanitation services. While the Department can make policy statements on functions for which it is wholly or partially responsible, it can only express views on functions which fall outside its brief.

Part B summarises aspects of the provision of water supply and sanitation services in which the Department is directly and indirectly involved and to which it can contribute. It also identifies those areas of this policy which require further development. The report concludes by proposing a plan to initiate expedient action on this issue.

P A R T A

P O L I C I E S A N D V I E W S

2.0 PROVISION OF SERVICES TO DEVELOPING COMMUNITIES

2.1 BASIC WATER SUPPLY AND SANITATION STANDARDS

The Department accepts that formal and informal communities warrant a supply of potable water for basic human needs, and a sanitation service for the disposal of waste in a manner which does not pose a health risk to the community or which is detrimental to the environment. The provision of water supply and sanitation services to a community must at all times be hydrologically and economically sustainable.

There are diverse views amongst development agencies regarding what quantity of water constitutes a basic supply. A minimum water supply necessary to meet human health and hygiene needs, is considered to be about 10 to 15 litres of potable water per person per day. However, a basic water supply which is sufficient to maintain acceptable minimum living standards is thought to be in the order of 20 to 25 litres per person per day, available during daylight hours. This Department does not support schemes which supply less than 20 litres of potable water per person per day. It should be noted that the International Water Supply Association have opted for a goal of 50 litres per person per day.

The principle of ensuring basic supplies accords with Government policy on the provision of services to developing communities. This policy states that:

"...the accent must be on minimum standards and the systematic upgrading thereof. Those who have already reached a high standard are entitled to a higher order of services" (White Paper on Land Reform, 1991; WP B-91)

Another aspect which must not be overlooked is accessibility, or the maximum distance people have to travel to collect water. Again, views on this vary from one development organisation to another. Maximum distances of 100-250 m for urban communities and 200-500 m for rural communities have been quoted. The Department takes cognisance of the fact that travelling long distances on foot to collect water prevents women from being economically

active, keeps them away from their families, reduces the time available for children to be educated and, in some situations, may encourage families to have more children so that the burden of water carrying can be shared. In short, poor accessibility to water is not in the interests of the individual, the community or the nation. Unfortunately, the dynamic characteristics of many developing communities in South Africa precludes the setting of a permanently achievable fixed maximum distance. Instead, the Department believes that the developer of a water supply scheme should always gain agreement with the community on the shortest possible distance, which is both technically feasible and affordable.

There is little chance of a scheme being successful if the community are dissatisfied with the travelling distances to water.

2.2 APPLICATION OF APPROPRIATE TECHNOLOGY

South Africa's particular mix of interdependent First and Third World communities creates problems for those involved in the provision of basic services. The exposure of South Africa's developing communities to First World living conditions, both through the media and via the work place, heightens aspirations, making it increasingly difficult to gain acceptance of rudimentary water supply and sanitation technologies. This situation is exacerbated by examples of inappropriate technology in elaborate water supply and sanitation schemes, many of which were constructed for exemplary or prestige purposes at a time when State funding was readily available. Some of these schemes have become technically and economically unsustainable by the communities they were designed to serve, resulting in the operation of these schemes by private enterprise and the inevitable subsidisation of running costs.

The Department strongly believes that the developers of water supply and sanitation schemes must ensure that appropriate, affordable and upgradable technologies are implemented in all instances. South Africa can afford neither unnecessarily elaborate, nor substandard schemes. This will probably require additional emphasis being placed on the education of communities during their involvement in the planning and design of schemes. Also, the application of appropriate technology can easily be undermined by obvious inconsistencies in the characteristics of schemes from one community to another. Hence, it is essential for development organisations to have a unified approach. Organisations or influential groups with a preference for, or vested interest in, a certain type of scheme could

complicate the implementation of this policy. Therefore, in the interests of both consumers and funding bodies, the nature of new water supply and sanitation schemes will have to be monitored, preferably by a single national organisation.

2.3 INTEGRATION OF COMMUNITY UPLIFTMENT STRATEGIES

The upliftment of developing communities is urgently in need of national co-ordination. The Department believes that there is limited value in having a water supply and sanitation strategy which is not part of a *total development strategy*. Water supply and sanitation for developing communities should ideally be integrated with programmes for the provision of shelter, basic health care, population development, education and energy supplies. To tackle individual components in isolation could lead to the implementation of incompatible initiatives, the duplication of effort and the wastage of scarce resources. The co-ordination of the various organisations involved in the upliftment of developing communities is therefore essential. However, the Department acknowledges that until such co-ordination is formalised, any attempt to introduce it on an ad hoc basis could lead to unjustified delays in the provision of vital services.

2.4 CONSTRAINTS ON THE PROVISION OF SERVICES TO DEVELOPING COMMUNITIES

The quantity and quality of available water should not be seen as a physical constraint in deciding where developing communities could be established and permitted to grow. Water is a relatively transportable commodity which, from an engineering point of view, can be conveyed almost anywhere. In addition, current water treatment technology can meet high water quality standards. The overriding constraint for both the conveyance and treatment of water is cost, a factor which must be considered when locating a developing community. It is far easier, and invariably cheaper to provide services to larger, higher density populations in areas close to established infrastructure. In such situations, economies of scale can result in a lower unit cost of water supplied. The opposite is often true for communities situated in rural areas, particularly in the more water-deficient parts of the country. In the case of small isolated communities, consumption levels may be too low to justify the cost of conveying water over long distances. In such instances, the treatment of poorer quality, but more localised, water resources may have to be considered. Where large, rural communities are distributed

over wide areas, the provision of a reticulated piped water supply is often financially prohibitive. The development of local ground water resources, including natural springs, is often the only economically feasible means of supply for this type of community.

It is worth noting that existing water supplies in some developing rural and peri-urban communities consist of the sale of untreated water in unsuitable containers (+ 20 litres), for about R10-R25 per cubic metre, a price which would be completely unacceptable to First World consumers.

2.5 EFFECT OF SERVICES ON POPULATION MIGRATION

The deliberate influencing of human migration patterns is not a function of agencies providing water supply and sanitation services. The objective in the provision of basic services to a developing community must be to adequately meet the immediate needs of that community. However, in order to avoid unacceptable delays between the arrival of migrants and the provision of services, a measure of anticipation and preparation is required. The question that arises is whether or not the timely provision of serviced township plots encourages migration from rural areas.

Experts in this field have advised the Department that eventually, knowledge of available serviced sites in urban and metropolitan areas will influence the location of migrant populations. However, the primary *push-pull* factors in migration are perceived employment opportunities, and not water supply and sanitation facilities. Therefore, the provision of such services is unlikely to have a significant impact on the number of actual migrants in the long term.

From an engineering, economic and environmental position, the ideal situation would be to have sustainable, discrete rural communities, the sizes of which exceed neither the carrying-capacity of the supporting land area nor the maximum potential of the local economies, combined with substantial carefully planned and adequately serviced urban communities which are well placed to contribute to, and benefit from, economic growth in the formal and informal sectors. The Department recognises that it is important for people residing in urban areas, to whom cultural values are important, to have the support of their traditional tribal communities. This support would be eroded if living conditions in rural developing areas were permitted to deteriorate because of inadequate basic services. Hence, a balanced approach to the provision of services in both rural and urban areas, which is commensurate with socio-economic

development patterns, is necessary.

2.6 SETTING DEVELOPMENT OBJECTIVES

It has become common practice among development agencies to stipulate specific targets when launching upliftment programmes. International development agencies have on several occasions set area-specific targets for community health, housing, literacy etc. One of the better known and more ambitious targets was the United Nation's International Drinking Water Decade, which was aimed at giving every person in the world access to a supply of potable water by 1991.

Targets have two benefits. Firstly, they help focus the efforts of development agencies and maintain the momentum associated with aid programmes. Secondly, they inform developing communities of when they can expect improvements in their quality of life. The drawback of this approach is that failure to achieve a target can result in a negative reaction from the very community one is trying to uplift, especially when Government agencies are charged with supplying the services. Thus, if targets are to be set it is important that they are achievable.

Three requirements which must be met to ensure the successful attainment of targets are technological feasibility, adequate resources and political intent. Technological feasibility determines what can be done, adequate resources (money and manpower) determine when it will be done, and political intent determines whether it will be done. As stated in 2.4, there are no major technological obstacles to the provision of basic water supply and sanitation services in South Africa. Also, the necessary skilled manpower is available in the country. Finance is always a constraint in development programmes, hence it is important to attract funding from a wide range of donors. An internationally acceptable South African strategy for water supply and sanitation may assist in this regard. However, political intent is probably the most important criterion in development projects. If these projects do not receive full political support at all levels, from Central Government down to the individual communities, they are unlikely to succeed.

2.7 DETERMINING THE NEEDS OF DEVELOPING COMMUNITIES

The Department realises that before the design of water supply and sanitation schemes can proceed, investigations are essential to determine the precise needs of the

community and the way in which they should be met. These needs must not only be expressed in technical terms such as water demand distributions, but also in sociological and cultural terms.

The Department believes that, where possible, joint information gathering exercises to meet the data needs of other organisations involved in development, should be conducted in order to reduce costs.

3.0 INSTITUTIONAL CONSIDERATIONS

3.1 ROLE OF GOVERNMENT AND OTHER DEVELOPMENT AGENCIES

Evidence from the United Nations and the World Bank suggests that when Government organisations provide developing communities with water and sanitation schemes, the regard the people have for the scheme, their positive involvement in its management, and their acceptance of the principle of paying even a nominal fee for the service, is low. This is partly attributable to the paternalistic way in which some Governments approach development schemes, and partly to the way in which some communities perceive their Governments as dutiful providers of unlimited services.

In view of the limited acceptability of Government organisations among many of South Africa's developing communities, the visible or perceived involvement of these organisations in water supply and sanitation schemes should be kept to a minimum, at least in the short term. This accords with the Department's current policy of not being directly involved in the provision of water supplies at a community level.

However, the Government should avoid establishing completely new institutional structures to attend to these projects. Consideration should rather be given to using existing organisations which enjoy credibility and acceptability among developing communities. It is therefore important to identify a nationally established, independent, non-profit, politically-unbiased organisation to which funds earmarked by the State for welfare works can be channelled for basic water supply and sanitation schemes. This organisation should ideally be controlled by a board comprising financial, technical, cultural and community representatives. Existing national organisations which could qualify or contribute are the Development Bank of Southern Africa, the Urban Foundation and the Independent Development Trust.

In areas where water boards, regional services councils or other Government related organisations have established a good co-operative and productive working relationship with developing communities, these bodies should be encouraged to continue their efforts. Where possible such organisations should not be hampered by inappropriate regulations intended

for their original First World customers.

Where no organisation is willing or able to cater for the basic water supply and sanitation needs of a developing community, as a last resort the Department may, after consultation at the highest level, have to assume responsibility and attend to the necessary works. In theory, existing constitutional structures and statutory bodies should make this function superfluous. However, in view of the changing situation in South Africa, it is felt that such a commitment is appropriate.

3.2 A CO-OPERATIVE NATIONAL STRATEGY FOR WATER SUPPLY AND SANITATION

Realising the major benefits that can be gained from co-ordinated and co-operative actions in the field of water supply and sanitation for developing communities, the Department will support and will participate in positive initiatives to achieve these objectives on a national basis.

The formulation of a national strategy is seen as an essential first step in this regard. Such a strategy should include the following four components:

- Institutional structures;
- Finance;
- Guidelines and procedures;
- Monitoring and assessment.

At a national level the Department recognises a need for two primary institutions: a Government organisation and a non-Government organisation. The Government organisation would have to be some form of Interdepartmental Task Group (ITG) set up to determine policy, advise Government and monitor the water supply and sanitation problem and the progress made towards its alleviation. This Task Group should include, among others, the departments of Water Affairs and Forestry, Development Aid, Health and Population Development, Planning and Provincial Affairs, and Finance.

The ITG would need to reside in an established State organisation for administrative, logistical and computer support. In view of its strong background in water resources management, the Department of Water Affairs and Forestry is an appropriate home for this Task Group.

The non-Government organisation is essentially the independent national development organisation (INDO) referred to in 3.1. This organisation must be in a position to receive funds from the State, the private sector,

international development agencies and foreign governments, and to administer them in a manner which is acceptable to both donor and beneficiary. It must however, have full control over the allocation of funds to the various water supply and sanitation projects and the organisations undertaking these projects. Although some of the INDO's funding may be in the form of State funds and donations which do not require repayment, it may prove necessary to obtain development loans from abroad which will require repayment. Additionally, any funds that are recovered as part of the capital costs of schemes will have to be returned to the INDO for loan repayment and reassignment. Therefore the INDO will have to function as a non-profit banking institution for welfare orientated work.

The national strategy must also include a standard financing approach which would have to be agreed on by the State and other funding agencies, and implemented by the INDO. This standard financing approach is discussed in 7.5.

Guidelines and procedures for the development of water supply and sanitation projects will have to be drawn-up by both the ITG and the INDO. These should be adhered to by the developers of water supply and sanitation schemes.

Finally, the national strategy must have a monitoring and assessment component to keep track of the nature and size of the problem, record progress and check that minimum standards and set procedures are being maintained.

3.3 POLITICAL ACCEPTANCE OF A WATER SUPPLY AND SANITATION STRATEGY

There should be a structured approach to gaining political acceptance of a national strategy for the provision of water supply and sanitation services. At the national level the Government (Ministers and heads of departments) should hold discussions with national political and cultural groups aimed at reaching agreement on an overall water supply and sanitation strategy. At the regional level the regional offices of this and other departments, second tier government and, where appropriate, water boards should meet local politicians and welfare organisations to identify and determine priority communities, and to formulate a regional programme for meeting their needs. At the local level, organisations responsible for the execution of water supply and sanitation projects should consult local authorities and community leaders to determine their opinions regarding the acceptability and workability of the strategy.

3.4 EXPEDITION OF DEPARTMENTAL CONTRIBUTIONS

The Department is aware of the urgency associated with the provision of water supply and sanitation services. It is therefore ready to expedite and, where possible, streamline its contributions and the procedures for the necessary inter-organisational consultations.

3.5 REGIONAL AND LOCAL GOVERNMENT

It is the Government's policy to devolve responsibility for the provision of community services. However, where second and third tier local authorities are not yet functional, or where there is an acute shortage of suitably skilled staff, the Department is prepared, on request, to offer appropriate assistance until alternative assistance can be arranged.

The Department believes that there is little value in devoting time and effort to debating major changes to the way in which second and third tier government institutions handle water supply and sanitation issues. There is a possibility that these structures will be affected by the outcome of constitutional negotiations. Therefore, the emphasis should be placed on getting existing regional and local organisations to co-ordinate their activities more effectively. In this regard the Department welcomes recent moves towards combined local authorities as this makes better use of the available expertise in the provision of community services.

4.0 CHARACTERISTICS OF WATER SUPPLY AND SANITATION SCHEMES

4.1 COMMUNITY INVOLVEMENT

The community must be involved at all stages in the development of a water supply and sanitation project, from initial planning and design, through construction to final operation and management. Communication with the community during the planning of a scheme must be two-way. Firstly, communities need to be educated and informed on basic water issues. This aspect is more fully addressed in the next section. Secondly, authorities and developers must identify bona fide representatives of the community and listen to their needs and opinions. This combined approach should be aimed at achieving consensus on the following aspects of a scheme:

- Physical and technical characteristics;
- Custodianship, maintenance and operation;
- Financing, tariffs and revenue collection;
- Future expansion and upgrading.

In the planning and design stage, care must be taken to ensure that emphasis is focused on the role of women, particularly when deciding on features such as standpipe density. It should be noted that in communities where, prior to the provision of these services, women spent the major portion of their day carrying water, some form of vocational training may have to be made available to encourage them to use their additional free time beneficially.

Local labour should be used whenever possible during construction of the scheme. Also, the future operators of the scheme should be drawn from the community and trained to the required level. The involvement of external organisations in the provision of the scheme must be de-emphasised once construction has been completed. These initiatives should help the scheme acquire a community identity.

4.2 EDUCATION PROGRAMMES

Water supply and sanitation schemes to developing communities must be coupled to an education programme for the people served by the scheme. According to a media review of the United Nation's International Drinking Water and Sanitation Decade, a UN official was quoted as saying

"The question is not only how to improve water and sanitation, but how to increase the health and quality of life for those people who need these services".

There is little benefit in providing a disinfected water supply if the users are uneducated in the basics of personal hygiene. An appropriate education programme should address the following areas:

- Basics of the hydrological cycle;
- Hygiene, and water quality;
- Reconciling demand and supply;
- Interaction between man and his environment;
- Cost of schemes and tariff calculations.

The education programme must also emphasise and encourage community involvement with the scheme.

Evaluation of the effectiveness of educational programmes should be continuous.

4.3 UPGRADING OF SCHEMES

The possibility of future expansion and upgrading must always be considered in the original design of water supply and sanitation schemes. These services are part of the broader effort to promote socio-economic upliftment, hence further entrenchment of poor living standards must be avoided when opting for rudimentary schemes. The physical characteristics of water supply and sanitation schemes must not become obstacles to further community development.

The characteristics of each scheme must be compatible with the:

- Population dynamics of the community;
 - Characteristics of schemes providing other basic services to the community;
 - Economic status of the community;
 - Educational and technological level of the community.
-

4.4 PROVISION OF SERVICES TO TEMPORARY OR SQUATTER COMMUNITIES

The provision of basic water supply and sanitation services by any agency on humanitarian grounds does not legitimise nor condone the occupation of a given site. Where possible, such schemes should have a temporary character and should be a precursor to the provision of permanent and upgradable water supply and sanitation services at an acceptable legitimate site.

4.5 FLOOD MANAGEMENT

Although not directly linked to the provision of water supply and sanitation, flood management is a critical water-related factor which must be considered when locating developing communities. It is also a factor which must be impressed on those who influence the siting of informal settlements, particularly on flood plains and on unstable ground in flood-prone areas. The Department is currently in the process of conducting a major review of its flood management policy, the outcome of which will be made known during the next year.

Whilst the Government has a social responsibility to assist all communities during exceptional disasters, it has become increasingly apparent over the years that floods in South Africa, though sporadic in occurrence, should not be regarded as unexpected.

To date, the Department has regarded control over urban development on flood plains as one of the most effective preventative measures to limit flood damage. In terms of section 169A of the Water Act, 1956 (Act 54 of 1956), no formal urban development may occur without the flood levels expected at prescribed flood recurrence intervals being indicated on the layout plan. This alerts the authority empowered to approve new development to the vulnerability of certain areas. It is important to note that such flood lines cannot be determined precisely, nor are they stable, since upstream and downstream changes in land use and improved hydrological information and the analysis thereof, may alter their position later. The changing nature of flood lines places a special responsibility on authorities to plan the positioning and layout of new developing communities competently. Township planners should therefore zone each area intelligently and plan for emergency measures. Expert interpretation of the particular circumstances in each case is essential, rather than just the routine application of the rules. For instance, instead of simply fixing the development boundary at the flood line

associated with a given recurrence interval, other factors such as river characteristics, the effect of structures and obstacles on flood flows, and evacuation routes should be considered.

It must be noted that the Department's current flood management legislation only applies to formal settlements. Its application to informal settlements is an issue which is being addressed in the flood policy review.

4.6 EMERGENCY SITUATIONS

In emergency situations such as drought, contamination of sole water supplies, epidemics of water-borne diseases and other disasters, the resources of the Department are available immediately to the organisation charged with co-ordinating the relief programme. Where possible, the Department will meet the costs associated with its involvement in such a programme from its own budget, unless otherwise instructed by the Department of Finance.

5.0 WATER QUALITY ASPECTS

5.1 CONTROL OF POLLUTION FROM DEVELOPING COMMUNITIES

The Department will monitor known developing communities with respect to the pollution of stormwater runoff and ground water infiltration. In cases of observed negative impacts, the Department will raise the matter with the responsible authority to initiate remedial action. Where the authority does not have sufficient expertise to address the problem, the Department will assist.

The scope for applying conventional pollution control enforcement procedures to developing communities is limited. If such a community were to be prosecuted for contravening pollution regulations, it is unlikely that it would be able to pay a fine. If it could, this would only deprive the community of the funds required to remedy the pollution problem.

The Department considers it preferable to ensure that its effluent discharge and waste disposal standards are incorporated into the design of the sanitation system. If, in the course of time, such a system were to fail to meet the specified standards (perhaps due to an increase in population) then the Department will have to consider motivating, through the appropriate channels, for funds to be made available to upgrade the sanitation system.

5.2 WASTE DISPOSAL SITES

In the interests of water quality management, the Department administers section 20 of the Environment Conservation Act, 1989 (Act 73 of 1989) which controls the establishment and operation of waste disposal sites, inclusive of sanitary landfill sites, via a permit system which stipulates conditions for the effective management of a site. Waste disposal sites which are used by existing developing communities are often difficult to control effectively due to the lack of planning when the community was first established, and the shortage of funds and trained personnel to manage the site adequately. In several instances the expansion of a community has encroached onto a waste disposal site.

For these reasons, the Department favours the establishment of more viable regional waste disposal sites to meet the collective needs of several developing communities as well as those of towns in the same vicinity. Such sites would be more economical, easier to control and would pose a reduced risk to the environment.

The establishment of these sites will require funding. As there are no State subsidies for waste disposal sites, it will be necessary to consider whether a Departmental subsidy would be justified in these circumstances. Such a subsidy would also afford the Department's waste management officials a measure of control over the selection and establishment of the site.

The problem that remains is to determine who pays for waste collection and the proper management of the site. Such costs can only come from service rates levied on the community, which in the case of very poor communities, may also have to be subsidised. There is potential scope for the informal sector to become involved in the collection of waste, and perhaps the possible extraction of recyclable material. There are impressive examples of domestic waste management being handled by the informal sector in other parts of the world. However, the economic incentives have to be sufficiently attractive.

5.3 SELECTION OF APPROPRIATE SANITATION SYSTEMS

The Department can influence the selection of the type of sanitation system on the basis of the pollution threat to local water resources and the environment, and, where applicable, the use of the effluent as a water resource.

At present there is a wide range of sanitation systems available to developing communities. These range from soak-away systems such as pit latrines, septic tanks and French drains, to more costly water-borne sewerage systems. For each system there are a number of variations to suit both the socio-economic status of a community and its longer term aspirations.

Conservancy tanks and bucket collection systems are in general inappropriate for developing communities. The former is too expensive to be considered on a large scale whilst the latter represents a significant health risk to the operators, assuming willing employees can be found. Also, both systems can lead to major waste disposal problems.

Although it is ordinarily appropriate to select low cost systems for the provision of basic sanitation service, such systems may not always be suited to the location or site characteristics of a community. Also, as a community grows, the original sanitation system may become inadequate or unsuitable.

In the case of soak-away systems, the following factors have to be considered:

- Depth, absorptivity and moisture retention capacity of the substrate;
- Slope of the land;
- Proximity to surface and ground water resources;
- Utilization of the surface and ground water resources which may be affected, especially the protection of the community's water supply;
- Present and future dwelling density.

Where communities rely on ground water abstracted from beneath their site, the likely impact of these types of sanitation system must be investigated in detail to prevent contamination of the water supply.

Soak-away sanitation systems cannot always be considered permanent solutions for high-density situations, particularly for developing communities in urban areas. As the population grows the filtering and nutrient retention potential of the substrate can diminish until it eventually becomes saturated and ceases to be a safe method of waste disposal. Once a soak-away system becomes inadequate, the choice of alternatives is limited.

Often, the only realistic long term option for upgrading sanitation is water-borne sewerage systems. Apart from the high capital cost and increased operation and maintenance costs, this system invariably leads to a significant increase in water consumption by the community. This increased consumption can be limited by the adoption of small-bore, solids-free systems. However, an assured supply of water is still a prerequisite for all water-borne sewerage schemes. The problems of meeting increased demand from water-borne sewerage can, to some extent, be offset by the effluent return flow from the community. This effluent can be treated and recycled or reintroduced into the natural drainage system for later reuse.

The main problem of the introduction of water-borne sewerage is that the water supply system may have to be upgraded to cater for service connections to individual dwellings. Should a community be unable to afford the essential upgrading of water supply or sanitation facilities, this

will have to be subsidised. Another problem with water-borne sewerage systems is that they can, and do leak, particularly when installed on steep ground. The leakage of untreated sewerage can quickly contaminate ground water especially in situations where the ground beneath the sewerage pipelines has limited filtering potential.

In view of these problems, the Department regards it as vital that full consideration is given to the physical characteristics of sites when selecting locations for developing communities. Although the characteristics of water supply and sanitation services should at all times be compatible with the socio-economic status of the community, the upgrading of these services should ideally be prompted by the socio-economic advancement of the community and not by the inadequacies of the site. If this aspect is overlooked it is likely to result in a growing financial burden being placed on the State for the essential upgrading of township water supply and sanitation services.

5.4 DIFFUSE-SOURCE POLLUTION

The Department has, in the past, concentrated on the control of point-sources of pollution. However, diffuse sources of pollution, such as nutrient and sediment rich storm wash-off from agricultural lands and informal settlements, are a significant contributing factor to water quality degradation. Where diffuse-source pollution from a developing community presents a serious threat to water quality, existing sanitation and stormwater management facilities must be investigated to ensure that they are adequate and in working order.

The Department is acutely aware that, since the removal of Influx Control, a number of steadily growing informal settlements that do not have proper services, now exist. For water supply reasons many of these communities are located in close proximity to rivers. Should these settlements pose a serious pollution threat to in-stream and down-stream water users and should no organisation be either able or willing to remedy the situation, then the Department will have to take the necessary steps to prevent further water pollution. However, such measures will be costly and the Department will have to request the Department of Finance for the necessary funds, generally with the approval of Parliament.

5.5 INDUSTRIAL POLLUTION AND DEVELOPING COMMUNITIES

Section 6.6.1.4 of the Government's 1986 White Paper on Urbanisation states that:

"potentially troublesome industries should, however, be located so as not to have an adverse effect on future residential areas".

Although the Department is, in terms of section 12 of the Water Act, theoretically able to control the location of those industries using more than 150 cubic meters of water per day by the granting of water consumption permits, this clause is seldom used for this purpose. In practice, the Department prefers to use negotiation, water pricing and site specific pollution control directives, to influence the location of such industries.

Where an industry wishes to establish upstream of a developing community, any effluent discharge directives issued to that industry will be sufficient to safeguard the health and welfare of the community at all times. Where a developing community, which relies upon a river for water supplies, is established subsequent to the issuing of effluent discharge directives to an upstream industry, those directives may be reviewed depending on the nature of the pollution threat. Ordinarily, the health and welfare of any community takes precedence over effluent discharge agreements with industry. However, in potential conflict situations, negotiations with all the parties concerned will be held to determine the least-cost, most acceptable solution.

6.0 GROUND WATER

6.1 LEGAL ASPECTS OF GROUND WATER DEVELOPMENT

In terms of the Water Act of 1956, ground water is considered to be private water. A landowner is therefore entitled to search for it and to utilise it, even though he may reduce the supply to his neighbour, or deprive his neighbour of water altogether. Ground water development for a supply scheme to domestic users can only be undertaken if the developer, including the State, is the owner of the land on which the water has been found or has negotiated such a right with the landowner. An exception occurs where the Minister of Water Affairs and Forestry, acting in the public interest, proclaims a Subterranean Water Control Area. In such an event, after having acknowledged existing use of the resource and made water allocations accordingly, the Minister may then abstract and supply ground water to a community, providing sufficient water is available.

Alternately, under section 123 of Provincial Ordinance 20 of 1974, a local authority, with the approval of the Administrator of the Province, may expropriate a portion of land on which a borehole is located, for water supply purposes.

6.2 WATER SUPPLY IN RURAL AREAS

The Department is of the opinion (as stated in 2.4) that local ground water development is probably the best water supply option for many rural developing communities. Not only is it cheaper, but recipient communities can become self-sufficient and accept ownership and responsibility far sooner than with regional piped water schemes. However, four main problems are associated with using ground water. Firstly, formal developing communities often reject proposed ground water schemes because they lack confidence in the ability of the resource to meet their long-term needs. They believe that what cannot be seen, cannot be relied upon. Secondly, the problem of finding robust, reliable and easily repairable ground water pumps is unresolved. This world-wide problem generally has its roots not in the design or manufacture of the pumps, but in the lack of maintenance expertise in the communities using them. Thirdly, the pollution of the ground water supply is a common problem in

South Africa. It is usually due either to the bad siting of boreholes or to subsequent human habitation above the aquifer. This problem can seldom be rectified as ground water quality is almost impossible to rehabilitate artificially. It can however be alleviated by appropriate land-use controls in the vicinity of water supply aquifers. Fourthly, once ground water is accepted by a community as a means of supply, a borehole can become overutilised, necessitating the drilling of more, or deeper holes.

These problems can be overcome by appropriate education and training in aquifer management, sanitation and its impact on ground water quality, and the maintenance and repair of pumps. The Department believes that such an education programme should be part of all ground water supply schemes to developing communities.

6.3 ESTABLISHMENT OF DEVELOPING COMMUNITIES ON DOLOMITIC AQUIFERS

Dolomitic aquifers in the Pretoria-Witwatersrand-Vereeniging area, and more specifically on the West Rand, are one of South Africa's few major aquifers, and have been earmarked as potential emergency sources of water to the metropolitan area during times of shortage. Consequently, these aquifers warrant protection from surface and underground activities which could lead to their degradation. Such protection can only be afforded in terms of the legal mechanisms mentioned in 6.1. However, the importance of dolomitic aquifers as an emergency source of water is likely to diminish once supplies are received from the Lesotho Highlands Water Project. This Project is expected to meet the demands of the region for the next 30 years. The dolomitic aquifers are currently used to augment water supplies to farmers and small towns.

The Department appreciates the need to identify land in the Pretoria-Witwatersrand-Vereeniging area for the development of new townships, and it realises that the land overlying certain dolomitic aquifers may appear ideal for this purpose. However, although some of this land may indeed be suitable for townships, from an engineering geology and water resources point of view there are areas where such development may not be advisable. Conditions vary considerably from one dolomitic compartment to another, therefore each proposal for development must be considered on its own merits.

There are two main risks associated with the establishment of developing communities on dolomitic aquifers. Firstly, certain dolomitic compartments are prone to subsidence or

sink holes caused by the collapse or compaction of the strata. In some instances sink holes are a result of deliberate aquifer dewatering by mines in order to protect underground workings. However, they can also be ascribed to changes in surface drainage and infiltration regimes. Secondly, as explained in 5.3, soak-away sanitation systems and waste disposal sites can pollute an aquifer thereby rendering the water less suitable for domestic use, or alternatively more expensive to treat to potable standards. It must be noted that not all ground water quality problems can be overcome through conventional water treatment processes. Nitrate, which is a major pollutant of aquifers underlying inhabited areas and which, in sufficient concentrations, can be extremely harmful to infants, is both difficult and expensive to remove.

The development of townships for low-income populations on the dolomites will expose the underlying aquifer to pollution. In some aquifers the pollution will be confined to that specific compartment, whereas in others the pollution may leak into neighbouring compartments. Although the large volumes of water stored in the dolomitic aquifers will dilute any pollution, it will only be a matter of time before urbanisation will make an irrevocable impact on the ground water quality. Several of these aquifers are already contaminated by sulphate pollution from mining operations.

Consequently, the Department does not favour township development on compartments where there is a substantial risk of subsidence or where the aquifer experiences a significant measure of utilization for domestic purposes.

The extent of existing sinkhole-prone areas is known, although surface subsidence is always a possibility in the less well-studied parts of the dolomites. As all dewatering operations by mines have to have a permit issued by the Department, consultation with the Department prior to the establishment of townships should assist in avoiding subsidence problems. The Department can also identify compartments where the ground water is already, or is likely to be, used regularly for supplying domestic consumers.

Where it is proposed to use dolomitic water to supply a community, particular attention must be given to the comments made regarding the pollution of aquifers (see also 2.5.3). The use of dolomitic water as a sole means of supply to a community located above the aquifer is not recommended and other sources of water should be used wherever possible. Where an alternative source of water is unavailable, abstraction from a compartment, which is not affected by surface developments, should be considered.

Where a dolomitic aquifer is used to supply a community with water, care must be taken not to draw down the aquifer below a prescribed level. In general, 7 meters below the natural ground water level is the maximum limit of abstraction, but this can vary from site to site.

Great care must be taken when designing and constructing surface drainage, waste disposal and stormwater management systems for townships on the dolomites, as infiltration from unlined channels or broken and leaking pipes can easily cause subsidence.

Within the constraints described in this section, the Department is amenable to the establishment of developing communities on dolomitic aquifers. In all cases, the Department and the Department of Mineral and Energy Affairs, must be consulted at an early stage in planning the location of townships on dolomite.

7.0 FINANCIAL ASPECTS

7.1 ESTIMATED COST OF MEETING WATER AND SANITATION NEEDS

Estimating the total cost of providing basic water supply and sanitation schemes in South Africa is very difficult with the present low level of demand sector information. A rough estimate for piped rural water supply schemes in the TBVC states and the Self-governing territories has been attempted by the Development Bank of Southern Africa. This yielded a figure of R600 per capita for the capital costs, which translates to a total required expenditure of R7,2 billion for these areas. This estimate was intended to alert politicians and community leaders to the economic realities of requesting funds for piped water supplies in rural areas. The comparative unit cost for urban communities is lower, due to the economies of scale mentioned in 2.4. Recent urban standpipe schemes subsidised by the Department have a per capita cost of between R40 to R50, although where bulk water supply infrastructure has to be upgraded this can increase to over R100.

Rural water supply schemes involving natural springs and ground water could, with careful selection of appropriate technology and labour inputs from the communities involved, be in the order of R20-R80 per capita.

Sanitation cost estimates for developing communities are highly site-specific. Costs of between R140 per capita and R1000 per capita, depending on the extent and sophistication of the scheme, have been quoted in the literature. Higher density urban communities are likely to be burdened with greater sanitation unit costs than low-density rural communities.

Based on the above figures, the Department estimates that the total cost of providing the current South African population with adequate water and sanitation will be of the order of R10-12 billion. In view of the present population growth rate, the cost of meeting these needs in 2020 could be three times this amount, at today's prices.

Obviously this amount, if available, could not be spent at once. The investigation, planning and community involvement required for each scheme will probably only allow approximately R1,5 billion (1991 prices) per year to be

allocated initially.

7.2 EXISTING DEPARTMENTAL SUBSIDY SCHEMES

Section 162 of the Water Act of 1956, states that the Minister of Water Affairs and Forestry may, upon application and out of funds voted by Parliament for this purpose, pay a subsidy on the costs involved in the construction of water supply and sanitation schemes. The Department's current subsidy system is multi-purpose, covering welfare, control and incentive objectives. The welfare component is intended to enhance living and health standards by making available sufficient quantities of suitable quality water at acceptable tariffs in cases where communities cannot afford the full cost of the water supply. The control function enables the Department to ensure the development of appropriate water resources, and the technical suitability and cost-effectiveness of schemes. Subsidies also provide an incentive to improve effluent quality by the development and upgrading of waste water treatment facilities.

These subsidies are available to local authorities situated in their proclaimed areas of jurisdiction and to the boards of established rural water supply schemes. However, provincial authorities and regional services councils can, on behalf of any community within their area, make an application to the Department for a subsidy. In terms of the Water Act, the Minister of Water Affairs and Forestry can award a subsidy to a maximum of one-third of the capital cost of the works. This limits the welfare value of the subsidy for those impoverished developing communities which cannot raise the remaining two thirds of the cost. If a larger subsidy is considered justified, the Minister must seek the approval of Parliament. A further limitation of the current subsidy system is that if an applicant receives additional funding from other State organisations, then that amount is subtracted from the subsidisable cost.

The subsidy scheme requires regular review to take account of changing circumstances. The task of meeting the needs of developing communities is sufficient justification for such a review. This review might also consider qualifying standards for subsidies. By assuming that water consumption is related to the standard of living and therefore the ability to pay, one possibility may be to grant a dynamic subsidy which is inversely proportional to the average water consumption per dwelling.

In the case of small communities in water deficient areas, the Department currently applies the recommendations of the Interdepartmental Committee on Water Supplies to Communities

in Water Scarce Areas which were accepted as Government policy in 1986. The policy states that if it can be shown that the cost of an adequate supply of water is beyond the financial means of a community, and if supporting that community is in the national interest, then water should be made available on a sliding scale of tariffs such that poorer communities can afford at least a subsistence quota. The community affected would be required to pay a tariff based on what they can afford, with a minimum rate of 50 cents per cubic meter. This tariff is applicable while consumption remains modest. Where water consumption rises, the tariff increases.

When a water supply scheme is heavily subsidised by the State, the Department generally selects the lowest cost option which meets the needs of the community. Consequently, although the wishes of community are fully considered in selecting a water supply option, it will not always be possible to accommodate their preferences regarding the source of the water.

7.3 COST RECOVERY FROM DEPARTMENTALLY FUNDED SCHEMES

The conditions applicable to the recovery of funds obtained from other bodies do not concern this Department. These include funds awarded independently by the State for welfare works. Only where funds are made available via Departmental subsidy schemes, or where water is supplied from a Government Water Scheme, can the Department specify cost recovery conditions.

The Department's approach to the financing and supplying of water for basic human needs and sanitation is spelled out in Chapters 6.6 and 6.16 of the *Management of the Water Resources of the Republic of South Africa*. Some relevant aspects of this are summarised below:

- Most water schemes include infrastructural components which are normally provided by the State in support of the economic development of the country. These components are usually funded by the State until a beneficiary who is capable of contributing to the costs can be identified.
- Affordability is an important consideration in the allocation of the cost of domestic supplies. This is particularly relevant to developing communities which cannot always meet the full cost of water supplies for basic human needs.
- Where the full cost of a basic water supply cannot be

afforded by a community, operating deficits should be recovered for as long as is necessary by means of published, regularly reviewed subsidies.

- Subsidies should be paid by the most appropriate body in each case. For example, the subsidization of a service that is intended to alleviate squalor in a certain community could be borne by the budget of the Department of National Health and Population Development, which is equipped to periodically review the merits of the case in the context of objectives other than those of water management.
- The difficulty in determining appropriate affordability criteria is one of the major problems in operating this type of subsidy system. Section 7.4 contains a proposal to deal with this.

The Department is not permitted to write-off all or part of the capital and interest associated with a scheme without the approval of Cabinet.

7.4 COST RECOVERY FROM SCHEMES FUNDED BY OTHER AGENCIES

There is widespread recognition that water supply and sanitation services should not be provided free of charge. Zero-tariff schemes have a long history of failure throughout the Third World and as such many international development agencies will no longer consider them. They can also lead to the wastage of water. However, it is unrealistic to expect full cost recovery from such schemes. Between the two extremes of zero-tariff and full cost recovery there should be a revenue level which satisfies funding agencies while instilling an appropriate sense of value and respect for the service in the minds of the consumer.

The present approach adopted by some independent development agencies is that, in order to ensure the sustainability of a basic scheme, the community need only assume responsibility for the operation and maintenance costs, while the capital costs are met from other sources such as donations from the private sector and more wealthy nations. This is an understandable approach in situations where meeting the needs of an impoverished community is viewed as an isolated project by a development organisation. However, the Department holds the view that it is important for a community to contribute, even a small amount, to the capital costs of a scheme as this reinforces the concept of community involvement and ownership.

7.5 ADOPTION OF A STANDARD FINANCING APPROACH

Inconsistency in the financing of basic water supply and sanitation services from one community to another can be expected to lead to resentment, accusations of partiality and the eventual rejection of the organisation responsible for co-ordinating the provision of these services. High variability in the characteristics of developing communities has already produced a range of financing methods for water supply and sanitation schemes, therefore agreement between all funding agencies on a common approach is essential and probably overdue.

The Department's current approach of using the economic status of the community and water consumption levels to determine affordable tariffs on a sliding scale is a robust and reasonable cost recovery mechanism for established communities that have achieved a measure of economic development. However, its applicability to Third World communities living in conditions of extreme poverty will have to be re-investigated. A criticism of poorly structured sliding scale affordability tariffs and deferred capital cost payments is that they have a tendency to reinforce the so-called *low-level equilibrium* trap and thus may discourage a community from striving for economic advancement.

It is important that the selected financing approach is capable of being well understood by the community members. Once again, current sliding scale affordability methods may perhaps be too complex and may lead to suspicion and resentment. However, overly simple techniques which encourage the abuse of services, such as flat rate tariffs for unlimited quantities of water, must be avoided.

Where a community cannot meet the operation and maintenance costs, tariff setting should be done via an independently conducted Community Means Test. This test should estimate the per capita income of a community in a prescribed manner and relate it to the per capita expenditure necessary for an agreed subsistence level. The Community Means Test should be initiated prior to the construction of a scheme and should be followed by negotiations with community leaders aimed at achieving acceptance of the results.

The test should be repeated periodically in order to adjust the tariff in accordance with any significant change in the economic status of the community, but not so frequently as to reinforce the low-level equilibrium trap.

This subsidy should ideally be kept to a minimum and should be considered temporary until the community can sustain the

scheme themselves. The sources and details of funding for the subsidy should be jointly determined by the State and the funding agency when the scheme is planned.

7.6 REVENUE COLLECTION

Although the Department does not wish to become involved in issues such as local tariff collection systems, it would prefer to see robust and viable methods agreed to before a water supply and sanitation scheme is constructed. Ideally, what is required is a dedicated water supply and sanitation account which gives priority to the regular payment of debts associated with the scheme. As a community develops, the installation of an acceptable household metering system may be warranted. The individual consumer or householder should ultimately be made responsible for the payment of service charges.

7.7 SERVICE CHARGE BOYCOTTS

The Department does not support the suspension of essential water supply and sanitation services to individual communities for any reason. There are major disadvantages in terms of human health, environmental protection and community relations, associated with this course of action. To encourage positive community involvement in water supply schemes, the physical characteristics and financing arrangements of these schemes should rather be designed such as to limit the effectiveness of negative community influences.

To discourage the withholding of tariff payments as a political bargaining mechanism, and the subsequent build-up of unrecoverable arrears, schemes should be designed such that the services can be reduced to an adequate but inconvenient minimum. In addition, a community fund intended to upgrade the quality of water and sanitation services and fed by a small surcharge on the tariffs, could be used to meet some of the costs during boycott action.

P A R T B

POLICY IMPLEMENTATION

AND

DEVELOPMENT

8.0 POLICY IMPLEMENTATION.

8.1 SCOPE OF THE DEPARTMENT'S INVOLVEMENT

Contributions which this Department can make to the provision of water supply and sanitation services to developing communities, lie in the following fields:

- Information management;
- Planning of the scheme;
- Ground water development;
- Advice on operation and control of schemes;
- Pollution control;
- Finance;
- Legal support;
- Education.

8.2 INFORMATION MANAGEMENT

Comprehensive and readily available information on water resources is essential to their development. The Department is establishing a national water information system which can be used in planning water supply and sanitation schemes. The system can currently offer information on the quantity and quality of surface and ground water resources. To complement its water availability information, the Department is also expanding its water demand database. This currently focuses on the water-use dynamics of certain urban areas, but it is intended to expand it to include relevant information on developing communities. It is possible that much of this information may be gleaned from the existing databases of other organisations.

Any outstanding information will probably be collected with the assistance of those specialist groups which enjoy a measure of co-operation among developing communities. When expanded, the Department's information system could be used to identify communities where services are inadequate or soon will be.

8.3 PLANNING

It is the Department's task to undertake water resource planning in order to reconcile demand and supply at a

national and regional level, and to co-ordinate planning at a local level. Although the Department concentrates on the provision of bulk water supplies, it can also assist with the planning of water supply and sanitation schemes to developing communities if required. The early involvement of the Department in planning a scheme is strongly recommended to ensure that the required quantity of water of a suitable quality is physically and legally available.

8.4 GROUND WATER DEVELOPMENT

The Department is available to assist with local ground water development when requested. The Department has extensive information on the ground water potential in South Africa, although some areas still remain relatively unstudied. This information is being further augmented by a project aimed at the regional characterization and mapping of the ground water potential throughout the country. The Department realises that easily understood synoptic information is necessary to inform the non-expert of the occurrence and development potential of ground water. This new mapping initiative is aimed at achieving maximum output within the shortest possible time. It is anticipated that the new national ground water maps will become a cornerstone of ground water development planning in both rural and urban areas throughout South Africa.

The Department has wide experience in the exploration and development of ground water for small communities. There is also considerable ground water expertise in the private consulting sector in South Africa. The assistance this Department can provide includes exploration, the siting and drilling of boreholes, evaluation of the ground water resource and guidance on the operation and maintenance of schemes. Advice can also be given on appropriate waste disposal and land-use control measures to ensure that important aquifers do not become polluted.

8.5 OPERATION AND CONTROL

Although the Department is currently devolving responsibility for the operation and maintenance of water supply schemes to other bodies, it is still willing to advise on the operation of schemes, particularly on contingency plans for the interruption of supplies due to unforeseen occurrences such as floods, droughts and pollution spillages.

8.6 POLLUTION CONTROL

The Department must ensure that liquid effluents are disposed of in terms of the Water Act of 1956, and that solid waste is disposed of in terms of the Environment Conservation Act of 1989. Departmental officials can advise on the safe treatment and disposal of effluents and wastes from developing communities.

The Department is also responsible for setting and maintaining standards pertaining to water supply and sanitation schemes. These include:

- Classification of all water-care works and their operators;
- Setting of quality standards for effluent to be discharged to a river or stream;
- Approval and classification of all solid waste sites.

It is important to tailor the design, construction and operation of water supply and sanitation schemes to the socio-economic and technological status of a community. Hence, some flexibility in the setting and maintenance of standards may be warranted, although this must not threaten the safety and well-being of the public and the environment.

It is also important to note that the Department's standards do not cater for every aspect of schemes to developing communities. Factors such as the standard to which potable water must be treated, an acceptable standpipe density for both rural and urban communities, and the characteristics of a basic water supply and sanitation service, have to be agreed.

8.7 FINANCE

The current arrangements and conditions for the Departmental financing of water supply and sanitation services is described in chapter 7. It should be noted that the Department has to submit a budget for approval, at least one year in advance, to the Department of Finance for the payment of subsidies, the appointment of consultants and the building of works.

8.8 LEGAL SUPPORT

Part of the Department's responsibility in administering the Water Act of 1956 is to regularly review its relevance to the present and anticipated needs of society. Amendments are therefore made to the Act and to the associated

regulations. Should amendments be required to cater for any problems pertaining to water supply and sanitation for developing communities, these will be given urgent attention.

8.9 PUBLIC LIAISON AND EDUCATION

The increasing number and complexity of problems associated with water scarcity and water quality, and the wide diversity of levels of understanding on water issues among the people of South Africa requires the Department to increase its involvement in the education of the public on water.

Although the Department is willing to contribute to the water components of community education programmes, it is not able to formulate and implement education programmes for each developing community served by a new water supply and sanitation service. Such programmes require a strong cultural component and need to be integrated with information on topics which are outside the scope of the Department's activities.

9.0 POLICY DEVELOPMENT

9.1 BACKGROUND

The Department has attempted to comprehensively address the known issues associated with water supply and sanitation. However, this document is far from complete. Several areas in which there are shortcomings have been noted in the text and there are more at the policy implementation level. The purpose of this section is to highlight key problem areas and discuss their further investigation.

Key problem areas can be placed in the following broad categories:

- Information;
- Institutions;
- Finance;
- Appropriate technology;
- Communication;
- Research and development.

9.2 INFORMATION

One of the risks in developing a policy to help resolve a problem of unknown proportions is uncertainty surrounding its affordability in terms of the ultimate cost implication. Therefore the first, and most important task is to collate all available information on developing communities and their existing facilities, and rank them in order of need. This could be achieved by developing an index which integrates selected criteria such as population size and structure, availability of water, the shortfall between demand and supply, and water quality or fitness for use. Following this, costs for the necessary water supply and sanitation works could be assigned to this priority list. This way, Government will be able to assess the relative seriousness of the situation and allocate resources accordingly.

The difficulty of this task should not be underestimated. Very useful information is kept by the Department of Health and Population Development and the Development Bank of Southern Africa. However, more information may have to be

collected. Also, a methodology will have to be developed which will allow reasonably good cost estimates to be derived from the available information.

9.3 INSTITUTIONS

Institutional aspects have been identified as an obstacle to solving water supply and sanitation problems in South Africa. This has also been the finding of a recent Government sponsored study into development assistance. As the Government's investigation is still underway, the Department will use this study to advance its proposals concerning institutional changes, as outlined in this document.

9.4 FINANCE

Integrating Third World welfare economics with First World financing methods is not easy, particularly if a reasonable measure of consistency in the financing of water schemes is to be maintained. This is demonstrated in Chapter 7 where issues such as a standard financing approach, tariff systems and subsidies are raised but remain unresolved.

Any attempt to devise a standard financing approach will have to be conducted in collaboration with existing and future potential funding agencies and other relevant Government departments. The Department is considering investigations on this aspect. It is also considering the review of its subsidy and water tariff systems pertaining to developing communities.

9.5 APPROPRIATE TECHNOLOGY

It is important to identify and document appropriate water supply and sanitation technology which has been tried, tested and considered suitable for South African conditions. Advice on the application of this technology, inclusive of technical, social, economic and educational aspects, must also be included. This guide should be regularly updated as new developments in technologies and materials occur. Such a document should have the support of both the State and the funding agencies and be regarded as a standard reference for those associated with water supply and sanitation for developing communities.

It is acknowledged that the Department of Development Aid and the CSIR have made major strides in documenting guidelines. However, this work needs updating and expanding

in view of the magnitude of the water supply and sanitation problem.

It is also important for a suitably qualified organisation to constantly monitor overseas developments in appropriate technology and to assess their application potential, possibly in a modified form, to South African conditions. This necessary work needs to be centrally co-ordinated and therefore funded by Government in conjunction with other research funding agencies.

9.6 COMMUNICATION

A well researched and well developed strategy for communicating with the user is deemed essential if efforts towards improved water supply and sanitation services are to show meaningful success. A communication strategy should include the following:

- Inclusion of water and sanitation issues in national educational curricula in consultation with national education authorities;
- Promotion of informal education on water for all members of developing communities at a local level;
- Public information dissemination via the media;
- Formulation of effective procedures for communicating with developing communities before, during and after the implementation of water supply and sanitation projects.

Communication has been identified in a recent report prepared by the Human Sciences Research Council (HSRC) for the Water Research Commission, as a key component of the non-technical aspects of water research. The Department is closely involved in this study. A workshop is planned for the near future to discuss the HSRC report and to formulate a master plan for non-technical water research. The issue of communication is likely to be high on the agenda.

9.7 RESEARCH AND DEVELOPMENT

As extensive appropriate technology research into water supply and sanitation is being undertaken overseas, it is felt that South Africa's efforts in this regard should focus on the monitoring and assessment work described in 9.5, with the exception of fields where we are at the forefront of technology. There is considerable scope for research into the non-technical aspects of water supply and sanitation, particularly in the field of communication as described in 9.6. The particular socio-political problems in South

Africa dictate that seemingly appropriate research results generated abroad cannot be readily imported.

The Department will negotiate with the Water Research Commission and other appropriate research organisations concerning research issues stemming from this policy document.

10.0 PROPOSED ACTION PLAN

Section 3.2 considered the promotion of a national strategy for the provision of basic water supply and sanitation services in South Africa. This strategy must be aimed at improving the quality of life for those South Africans who are living in unacceptable conditions. The Department is willing to play a significant role in the achievement of this goal. However, such goals are not attained by convincing strategies alone, but by sequences of critical decisions and actions taken by the appropriate authorities. This section outlines actions that are needed to successfully launch this initiative.

If this action plan is implemented with vigour, the funding of water supply and sanitation schemes could occur within twelve to eighteen months.

1. A national strategy for water supply and sanitation to developing communities needs to be agreed on as soon as possible. An initial steering committee comprising representatives of key interest groups is needed to expedite this task. This strategy should be forged with the close collaboration of both government and non-government organisations.
 2. As the confusing and overlapping responsibilities and financing approaches of several existing institutions are inhibiting water supply and sanitation problems from being adequately addressed at a national level, remedial measures should be proposed to the Cabinet at an early stage.
 3. To co-ordinate contributions from various State departments, a Government Interdepartmental Task Group (ITG) needs to be formed to focus on broad policy formulation and information gathering. The ITG must also pave the way for a non-government organisation to attend to the vetting and eventual funding of schemes.
 4. It is vital for Government to identify or establish an Independent National Development Organisation (INDO) to fund basic water supply and sanitation projects. The INDO will require State funding from the outset to function and to enable it to appoint consultants for the evaluation of proposals and the
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investigation of priority areas.

5. As soon as sufficient investigations have been completed, the INDO must submit its first one-year budget to Government for consideration.
 6. The INDO will probably need to institute a domestic and overseas fund-raising initiative for that portion of their budget that the State is unable to fund.
 7. Projects must be evaluated jointly by the ITG and the INDO to assess the performance of the national strategy and its associated policies. This will permit the rapid adjustment of the strategy should it be necessary.
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