Water Policies and Practices

BY HEATHER MACKAY

BACKGROUND: PRESSURES FOR CHANGE IN THE WATER SECTOR

Following the election of the new government in South Africa in 1994, the philosophy, priorities and approach to management of water resources and allocation of water have been subject to significant change. When Kader Asmal was appointed Minister of Water Affairs and Forestry, one of his first actions was to initiate a process of substantial review and reform of national water policy and legislation. The 1997 White Paper on National Water Policy (DWAF 1997) represented a key milestone in the process of reform of the water sector as a whole, and it will have far-reaching effects on social, economic and environmental issues in South Africa as it is implemented over the next 20 years.

In order to understand the potential effects of the new water policy, it is necessary to understand to some degree the primary driving forces behind the development of the 1997 water policy, since it is these forces, added to the dramatic political changes in the country, which shaped the new policy. Nevertheless, it is also necessary to understand that some changes can take a long time, especially changes in people's attitudes towards water, and the way in which they use and value water in their everyday life. New legislation can be a potent mobilising factor for change at the broad societal level, but shifting the underlying attitudes of individual people may take a generation or more. There are some universal principles related to the way in which western society tends to perceive and deal with water, and these principles may well be active, even in the "new" South African society, for some time to come, though national policy and legislation may have changed significantly. The degree to which the principles are active in the present and the future will determine the long-term success of the implementation of South Africa's new water policy. These principles were first described in relation to water law in the western states of the USA (Holub 1998).

The last twenty years have seen a definite shift in emphasis away from development of new water resources, towards management of existing water resources. This has been partly due to the fact that many of

the prime dam sites in the country have already been developed, but is also due to the increasing inability of the state to continue funding the high capital costs of new water infrastructure and water resources developments for government water schemes, as well as their ongoing operation and maintenance costs.

Prior to 1994, the 1956 Water Act had been the most recent legislation governing the water sector. The 1956 Act still focused very much on development of water resources, and like its predecessors, gave much attention to providing and allocating water for development in the agricultural sector. This was related to the historical political power base of the National Party in the commercial agricultural sector, and possibly also to the policy of discouraging migration away from rural areas to urban areas, which required the creation and maintenance of jobs in rural areas. Water rights were tied to land rights, in that a person who owned land over which water flowed had a right to a share of the "normal flow". In the event of uncertainty, this share would usually be determined by the Department of Water Affairs, and disputes were referred to the Water Court.

Even in 1956, the emerging realities were becoming clear to some people, especially the fact that in future the availability of water, at least in some parts of the country, could become a limiting factor for economic development. Although the mining sector had been and would remain a significant user of water, development and diversification of the manufacturing sector was leading to significant new demands for bulk water supply. Decision-makers were beginning to recognise the impacts of pollution arising from new manufacturing industries and from domestic sewage treatment works in urban areas. Hence new provisions were included in the 1956 Water Act, to address particularly the need to treat wastewater to minimum standards in order to address localised but growing pollution problems, and the requirement to return treated wastewater to surface waters instead of irrigating it on land, so that it could be available for re-use downstream.

The Commission of Enquiry into Water Matters (1970) highlighted many of the issues that were becoming evident during the 1950s and 1960s. The Commission of Enquiry played a pivotal role in

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initiating, through the subsequent creation of the Water Research Commission, and research programmes into system-wide water resources management problems and issues, such as eutrophication, inter-basin transfers and reservoir management. This work underpinned much of the development of knowledge related to aquatic ecosystem management, which in turn is reflected in the 1997 water policy and the 1998 National Water Act, but did little to change the general attitudes of people and policy-makers to water or to the environment, other than to emphasise that "something must be done".

During the early 1980s, data began to become available from the national water quality monitoring networks which indicated worrying long-term trends towards degradation of many primary water resources, despite the publication and implementation of the General and Special Effluent Standards in the 1960s. Population growth and migration to urban areas surpassed most expectations, leading to growing demands for water and sanitation and a need to allocate more water for bulk domestic and industrial supply as opposed to irrigation. In addition, during the late 1980s, the results of ecological research and limited monitoring by members of the scientific community were showing the potentially very damaging effects on aquatic ecosystems of over-abstraction and regulation of rivers. The global trend towards recognition and incorporation of environmental concerns into water resource management added pressure for change.

While some of these realities may have been evident in the 1950s and 1960s to officials and professionals in the water sector, they did not achieve a high priority on the national agenda until 1994. This is attested to by the fact that the portfolio of Water Affairs was generally considered an unimportant cabinet post with little attendant power. Though the Department of Water Affairs responded to growing pressure for change with several significant policy shifts during the 1980s (MacKay 2000), review and reform of water legislation were not possible in the prevailing political climate. Implementation of the policy shifts was hampered to a considerable degree by the lack of supporting legislation.

What very few people predicted, even in the 1980s, was the speed and scope of political changes in South Africa between 1990 and

1994. The provision of basic water supply and sanitation to the majority of South Africa's population, who were without these, and the need for equity in the allocation of water and the benefits of water use, were suddenly placed near the top of the political agenda. Finance would have to be found and water would have to be made available, reallocated from existing uses in some cases, to make progress in achieving the goals related to services and equity. It was abundantly clear that the 1956 Water Act was not adequate to promote rapid delivery on these goals, and so in 1994 a National Panel, broadly representative of all interest groups, was appointed to draw up a set of principles on which new water legislation should be based.

After an extensive process of public consultation, the Water Law Principles (DWAF 1996) were approved by Cabinet in 1996. From a political-economic point of view, the most significant principles were:

- principles 3 and 4, which led to the abolition of riparian water rights and private ownership of water;
- principle 7, which establishes "environmentally sustainable social and economic benefit" as a key criterion for water resources management and allocation decisions;
- principle 16, which provides for the use of economic instruments in the management and control of pollution; and
- principle 24, which states that beneficiaries of the water management system should contribute to the cost of its establishment and maintenance.

The 1997 water policy and its primary implementation mechanisms, the National Water Act (Act 36 of 1998) and the Water Services Act (Act 108 of 1997), were drawn up on the basis of the Water Law Principles, while continuing the process of consultation with stakeholders at both national and grassroots levels. The Water Services Act deals with the regulation of water services providers at the municipal level. The National Water Act addresses the development, management and protection of water

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resources, and the allocation of water from those resources. The following section describes the key features of the water policy and legislation in more detail, with an emphasis on the provisions of the National Water Act.

FEATURES OF NEW WATER POLICY AND LEGISLATION

At the time of publication in 1997 and 1998, respectively, the national water policy and the National Water Act were considered to be very progressive, and have since been used as models for water sector reform in several other countries. The vision behind the policy and legislation is captured in the succinct slogan adopted at the time by the Department of Water Affairs and Forestry: "Some for all forever". The idea behind this slogan is to recognise that water resources in South Africa are finite and limited ("some"); that their benefits should be accessible to all and shared equitably by all ("for all"); that they can be managed as renewable resources provided their environmental sustainability is not compromised ("forever"). These are the values presented in South Africa's National Constitution, translated into a vision for the water sector.

The most significant features of the new policy and legislation, which are likely to have effects on society and on the economy at national and local levels, are:

- the new, broad definition of water use;
- the provisions for equity of access to water and the benefits of water use;
- the provisions for ensuring ecologically sustainable development and use of water resources;
- new institutional structures and mechanisms for devolving decision-making down to the lowest possible level;
- the introduction of new economic instruments and new water pricing provisions.

Definition of Water Use

Whereas previously water use was commonly taken to mean only abstraction of water for offstream purposes, section 21 of the National Water Act now defines 11 different kinds of water uses requiring authorisation. These include storage and abstraction of water; impeding or diverting the flow of water in a watercourse; discharge of waste or heated effluent either directly to a water resource or in a manner which may impact on a water resource (such as disposal on land); alteration of the bed, banks, course or characteristics of a watercourse; removal and disposal of underground water (primarily related to mine dewatering); recreational use of water resources; stream flow reduction activities; and controlled activities (the last being a potential catch-all which allows additional activities to be included in the definition of water use if necessary).

There are two major implications of this new definition of water use:

- the full range of activities which may impact on the availability, reliability, quality and sustainability of water resources can be managed and controlled, where previously the provisions for control of aspects such as diffuse pollution of water resources, destruction of riparian and instream habitat, and protection of wetlands were not adequate, in water, environmental or agricultural sector legislation;

- a much wider range of water uses can be subjected to economic instruments such as charges, tariffs, incentives and penalties, potentially increasing the recovery of the costs of controlling and administering these diverse water uses and of managing water resources generally. One of the more controversial inclusions in the new Water Act was that of stream flow reduction activities as a water use (which presently only

includes commercial forestry, but which will gradually be expanded to cover other activities that significantly intercept or reduce the flow of water to lower-lying parts of a catchment, e.g. dryland sugar cane farming or small farm dams). The result of this has been the requirement for and somewhat reluctant agreement of the forestry industry to pay for the water that is intercepted by commercial plantations, and that would otherwise have been available as runoff for use by downstream water users. The successful inclusion in legislation of this provision relied upon the ability, established through research studies, to quantify the water used by commercial tree species.

Equity

The previous system of private ownership of water, with water rights being dependent upon land ownership, led to great inequities in access to water, whether to meet basic needs or for subsistence or commercial production, since the vast majority of people were not allowed to own land in South Africa. Surface water resources were frequently over-allocated, as landowners took their "normal share" of the flow, leaving downstream users without water; groundwater use often exceeded the sustainable yield of aquifers as pumping of private water was not controlled. Conflicts arose frequently, and as a result, several Government Water Control Areas were declared in various parts of the country, within which the allocation of surface water and the abstraction of groundwater were more strictly controlled by the Department of Water Affairs and Forestry.

Under the 1998 National Water Act, no private ownership of water is possible: there are only rights (for environmental needs and basic human needs), or authorisations to use water. National government is the custodian of the nation's water resources, and has the ultimate authority and responsibility for management of water resources and allocation of water for any of the 11 categories of water uses. The principle of riparian rights no longer holds, and anyone can apply for an authorisation to use water, regardless of whether they own land or not. This new situation is much more practical and suited to a largely semi-arid country such as

South Africa. Riparian rights were a feature of European law, and were more appropriate in a European situation where water is plentiful and surface flow relatively constant throughout the year.

It is also the responsibility of national government to "reserve" or ensure the provision of sufficient water in water resources to enable service providers to meet basic human needs (currently defined as 25 litres) of safe water per person per day within 200 m of the home) for all people in South Africa. Water for basic human needs has the highest allocation priority in the country, and the access to sufficient water for basic human needs is a right that is guaranteed in the Constitution itself. The 1997 water policy states that water for basic human needs will be provided free of charge, although the cost of the infrastructure to actually deliver the water might be charged for. More recently, a policy of providing free basic water to all people has been implemented, since it was found that many people, especially in rural areas, could not afford even the lifeline tariffs charged for basic services.

Authorisations to use water are granted in terms of the 1998 Act. A water use authorisation can be one of three kinds:

- A Schedule I authorisation, which includes amongst others the taking of water from a water resource to which a person has lawful access, for reasonable domestic use, small gardening (not for

commercial purposes), and watering of livestock (not feedlots). Schedule I use will not attract any charges or tariffs.

- A general authorisation, by which a water use is authorised for a group or groups of water users, as long as certain minimum requirements (currently set out in Regulation 1191 of 1999) are met.

- A water use license, for which an individual water user must apply to the relevant licensing authority, currently the Department of Water Affairs and Forestry. The application is evaluated according to the criteria of section 27 of the National Water Act, in terms of which the licensing authority must consider, amongst other things, the need to redress past inequities due to racial and gender discrimination, the impact of the proposed water use on existing lawful water uses, the socio-economic impact of the proposed water use, the investment made or to be made in respect of the proposed water use, as well as the efficient and beneficial use of water in the public interest (also defined as the most desirable combination of social, economic and environmental objectives: DWAF 1997). From section 27, it is clear that water should preferably be allocated for those uses which are of highest social, economic or environmental value, and which promote equity.

Environmental Sustainability

Apart from basic human needs, the only other right to water remaining in law is the water quantity and quality required to protect aquatic ecosystems "…in order to secure ecologically sustainable development and use" of water resources (NWA 1998). This is commonly known as the ecological Reserve, and together with the water reserved for basic human needs, forms the legally recognised "Reserve", which has the highest allocation priority and which may not be allocated for other uses.

Determination of the water requirements of aquatic ecosystems is a relatively new and still-developing science. Initially, techniques for

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determination were developed in the USA in response to the need to mitigate the downstream environmental impacts on salmon fisheries of large dams and regulation of rivers for industrial or agricultural purposes, such as hydropower generation and irrigation.

In South Africa, some of the first studies to estimate the "Instream Flow Requirements" (IFR) of aquatic ecosystems were carried out in the late 1980s in order to provide information on the water requirements of rivers in the Kruger National Park (Ferrar 1989; Moore et al. 1991). These aquatic ecosystems were at the downstream end of catchments where there was (and still is) a large demand for water for development, but under previous legislation, the Park itself had no rights to water. Over-abstraction upstream had caused some perennial rivers such as the Letaba and Olifants to cease flowing in the dry season, which was a source of major concern for both public and private sector conservation bodies due to the significant environmental impact of such a change in the flow regime. It was hoped that identification of the water requirements of the Park would help to promote negotiations with landowners and water users upstream, to persuade them to voluntarily release sufficient water for downstream ecosystem needs. At the time, this was justified in terms of the perceived "heritage value" of the Park, the responsibility of Park

management under the National Parks Act (Act 57 of 1976) to maintain pristine ecosystems within the Park boundaries (which the 1956 Water Act and its system of riparian water rights clearly could not support), and the significant ecotourism value of the Park to the region and to the country as a whole.

The passing of the Environment Conservation Act (Act 73 of 1989) and the adoption by the Department of Water Affairs and Forestry of the Integrated Environmental Management process (DEA 1992) required that IFR be determined in environmental impact assessments and mitigation studies for all water resources development projects. Method development for IFR determination continued amongst the scientific community, resulting in the Building Block Methodology (King *et al*. 2001), the DRIFT methodology (Brown & King 2000) and the South African Water Quality Guidelines for Aquatic Ecosystems (DWAF 1996).

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By the late 1980s the official policy had shifted from not recognising aquatic ecosystems at all, and considering every drop of water that reached the sea to be wasted, to the view that aquatic ecosystems had legitimate water requirements, but were competing users of water, and could be allocated water provided this did not compromise other water users to any great degree and did not constrain economic development. It took several landmark integrated studies, notably the work on floodplain subsistence agriculture on the Pongolo floodplain downstream of the Pongolapoort Dam (Heeg & Breen 1994), to demonstrate that the suite of ecological goods and services provided by aquatic ecosystems goes far beyond just water for offstream use, and that these goods and services could have significant economic and social value which had not previously been considered in planning and allocation decisions. At a policy level, the link between protection of the aquatic environment and sustainability of water resources was finally made in the early 1990s, was first articulated in the South African Water Quality Guidelines (DWAF 1996), and found its way, after much heated debate, into the Water Law Principles of 1996.

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right and on which many people depend for subsistence livelihoods. In order to protect aquatic ecosystems, it is necessary to provide sufficient water, at the right time, distributed in the right flow pattern and of adequate quality, to ensure that key ecological processes such as photosynthesis, reproduction, spawning and migration are sustained, and that biotic communities maintain their health and integrity. The National Water Act of 1998 was one of the first pieces of legislation in the world to provide for this water as a right rather than as an allocation (MacKay *et al*. 2002; MacKay & Moloi 2002).

Sustainable management of natural resources such as water also requires tradeoffs to be made between social, economic and environmental imperatives in order to find an appropriate balance. The Water Act of 1998 makes provision for a national classification system for water resources. In terms of this provision, some water resources may be classified as requiring a high level of protection, because of their value to society, and then the Reserve would be correspondingly more conservative, with additional safety factors built in to its determination. In some water resources, it may be necessary to trade off protection of the ecosystem against short-term imperatives for economic or social development, and these resources might be assigned a lower class and a correspondingly lower Reserve. They would still be afforded protection, but without the additional safety factors. The advantages of a national classification system are that it allows strategic decisions to be taken which recognise the true value of water resources, and that the decisions about tradeoffs are consistent and transparent to all, being encapsulated in the class assigned to a particular water resource.

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New Institutional Arrangements

Until 1994, water resources management and development functions had been carried out by national government (the Department of Water Affairs and Forestry) through a centralised, bureaucratic system. Although the Department retained, and continues to retain, a significant core of technical expertise, this centralised model was inaccessible to the majority of the population, and did not allow ordinary people to participate effectively in water management decisions. It is one of the cornerstones of the Constitution that people should be able to participate in the decision-making process as and when it affects them. Another important idea that is derived from the Constitution is the subsidiary principle, whereby functions that can be more efficiently and effectively carried out by lower levels of government should be delegated to the lowest appropriate level. In addition, experience from around the world is showing that management of natural resources is only likely to contribute to sustainability of those resources if local people are involved in and take ownership of the development of local solutions and options for resource protection, management and allocation. These factors led to the inclusion in the 1997 water policy and in the 1998 Water Act of quite specific provisions for the establishment of new institutional arrangements for water resources development, management and allocation.

Central government responsibility will be maintained for certain functions, including:

- policy formulation and regulation;
- development and maintenance of a national water resource strategy, which sets out the long-term goals and objectives for water management at the national level;
- joint management of international catchments.

In order to ensure that national interests are balanced with local interests, the Minister will retain the responsibility for: specifying the requirements of the Reserve; specifying international water requirements; specifying the water to be set aside to meet possible future contingencies or for strategic uses of national importance, and authorisation of inter-basin water transfers. The allocation of remaining available water to individual water users can be delegated to lower-level authorities or institutions, such as Catchment Management Agencies.

The country has been divided into 19 Water Management Areas (WMAs), which match the boundaries of major catchment areas. Within each WMA, various institutions can be established through which local water users and stakeholders can participate in water resources management. At the WMA level, Catchment Management Agencies (CMAs) can be formed. These will be statutory bodies, to which certain water resources management responsibilities can be delegated by central government as needed, and to the extent that capacity exists at the WMA level. Each CMA has a governing board, the composition of which is specified in the 1998 Water Act, to ensure representivity of all stakeholders and to prevent control of decision-making by powerful vested interests. Functions which are the responsibility of a CMA or which can be delegated to a CMA include:

- the development of a catchment management strategy, which must be consistent with the national water resource strategy;
- management of water resources and co-ordination of water-related activities of water users and other water management institutions in the WMA;
- setting and collection of water use charges; and
- allocation of water within the limits set by national government.

Water User Associations (WUAs) are co-operative associations of individual water users who have a common interest, such as the irrigation boards established under the 1956 Water Act, which must now be transformed into WUAs. New WUAs may be established for any purpose, but all WUAs fall under the authority of the CMA in whose area they operate, and certain technical or administrative functions may be delegated to them if this furthers the efficiency of water resources management and if technical capacity exists in the WUAs. Both WUAs and CMAs are expected to be self-sufficient financially, covering the costs of their operation from water use charges raised in the WMA, although the Department will support CMAs in their initial establishment and capacity-building phases.

The Water Act also makes provisions for the Minister to establish advisory committees, which can provide local input to decision-making as well as local knowledge and expertise. The Minister can establish international water management institutions to implement international agreements in shared river basins. The question of whether a public water utility or several regional water utilities should be formed to take responsibility for the development, operation and maintenance of major water resources infrastructure (such as inter-basin transfers and large schemes) is still being debated. The Water Tribunal is an independent body, established in October 1998, which can hear and adjudicate appeals against administrative decisions made by the Minister, the Department or other water management institutions. Should a person not be satisfied with the Tribunal's decision, they may still appeal to the

High Court, although there is no appeal against certain decisions such as the class, Reserve or resource quality objectives once these have been set by the Minister.

In terms of the 1998 Act, mechanisms have been provided for overseeing and auditing of the new water management institutions. A proposal must be submitted to the Minister from the stakeholders in a WMA, setting out the proposed functions of the CMA and indicating how the CMA's operation will be funded. Once the CMA has been established, prospective members of the governing board are nominated to represent stakeholder groups. The Minister, taking these nominations into account and with input from an advisory committee, appoints the members of the governing board of the CMA, and may appoint additional members as necessary to achieve appropriate representivity, particularly of previously disadvantaged communities and women. The Water Act provides considerable detail on the criteria for appointment of members of the governing board of a CMA. The CMA is responsible for drawing up a Catchment Management Strategy, which must also be submitted for approval, to ensure that it is consistent with the national water resource strategy. In addition, both CMAs and WUAs must prepare a business plan for approval by the Minister, and must submit annual reports. The intention of these provisions is to ensure transparency and accountability at all levels, and to minimise the possibility of powerful interests driving the water development and allocation agenda in any one WMA.

Economic Instruments ans Water Pricing

Under previous legislation, the pricing of water was inconsistent, and generally reflected neither the real cost of managing water resources and supplying water, nor the scarcity value of raw water. While urban users supplied by a water services provider, such as a municipality or water board, paid for the cost of the infrastructure to deliver the water, the raw water itself was generally drawn from a water resource by a bulk water supplier at a relatively low cost, depending on whether the bulk supply was provided from a government water scheme, a private water scheme, or simply from run-of-river abstraction.

The capital costs of government water schemes, supplying mainly agricultural water users but also some urban bulk water suppliers and industrial users, were financed by the state, and even operation and maintenance costs were often not fully recovered from water users. In 1994, government water schemes accounted for about one-third of all water use in South Africa. In the case of private water schemes, such as irrigation dams financed privately by groups of farmers, or reservoirs built and operated by water boards, the capital and operating costs were recovered in full from users of the schemes, but access to such water was limited to those who paid for it. Run-of-river abstraction by large and small users was not charged for. In contrast, the cost of water to rural households was (and remains) often extremely high, in terms of the time required for women to fetch water each day, or the actual price paid to private water vendors in the rural areas where such vendors operated.

In general, water itself attracted little or no charges, although the costs of the water infrastructure were passed on to water users to a greater or lesser degree, depending on whether the service provider was a private agency or the government. The costs of government's activities related to management of raw water sources, such as administration, pollution control and planning, were funded from the central treasury. The value of water to urban consumers and bulk water users in the agricultural and industrial sectors was very low, which was reflected in the price of water, with the result that water use in these sectors was generally wasteful and economically inefficient. For example, one of the problems associated with the previous system was that irrigation agriculture accounted for nearly 60% of total water use in the country, but contributed only a relatively small proportion of the GDP. This might appear to be inefficient use of a valuable resource, but the water so used does have a social value in maintaining jobs in the agricultural sector.

The increasing complexity and cost of managing water resources, especially as demands grew and water became more scarce, and the need to provide the poorest people in the country with safe, affordable water and sanitation, led to the introduction of far-reaching provisions in the 1998 Water Act for both cost-based and value-based pricing of water.

Water Pricing Principles

The principle behind the pricing policy for water (DWAF 1997) is that people should now pay for water at a rate which reflects its value and scarcity, with the exception of the water required to meet basic human needs, which is a right guaranteed by the Constitution. This principle remains controversial, with some people of the opinion that water is "from God" and should not be paid for, although payment for the water delivery infrastructure is seen as fair.

The total charge on water will be made up of three components:

- A charge to cover the costs of managing the raw water resources: This is a financial charge, calculated for each WMA on the basis of the budgeted costs for management, either by the Department of Water Affairs and Forestry or by a CMA to whom management functions have been delegated.

- A charge for development and use of government waterworks, with the aim of recovering capital costs, operation, maintenance and refurbishment costs and a return on assets (the costs of private water schemes are already fully recovered): This is also a financial charge, calculated separately for each water scheme.

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- A charge to promote equitable and efficient allocation of water: This is an economic charge, determined by the Minister, or through water trading or through a public auction process, to encourage the allocation of water to either redress inequities or for higher-value uses.

Water Pricing in Practice

The 1997 water policy indicated the need for water and water use to be priced at a level that reflects the true value of water to society. In theory, all of the 11 different water uses should attract charges, with the exception of Schedule I uses and water for the Reserve. In practice, somewhat different approaches will be needed for the different categories of water use.

- A pricing strategy for abstraction and storage of water and stream flow reduction activities was published in 1999, and is now being implemented (Regulation 1353 of 1999).
- A strategy for the determination and collection of charges for waste discharge is currently under development, and should be published in 2003. The polluter-pays principle will be applied, in order to encourage minimisation of waste and waste discharges to water resources, and to transfer, as far as is possible and practical, the downstream costs of pollution back to the polluter.
- Pricing strategies for the other water uses in section 21 of the National Water Act will be developed if they are necessary and can be practically applied.

The component charges which make up the overall water price will vary between the four water user sectors, namely: water services authorities (mostly municipal); industry, mining and energy; agriculture and stream flow reduction activities. The industrial, mining and energy sectors will attract charges for all water resource management activities, while the other sectors will not pay for certain activities (for example, the cost of subsidising alien vegetation control will not be factored into the agricultural water price, while the costs of dam safety control and alien vegetation

control will not be factored into the price paid by the stream flow reduction sector). Prices per unit volume of water may also vary between WMAs, depending on the costs of water resources management and the overall volume of water available for allocation after the Reserve and international requirements have been set aside (NWRS 2002). This approach should ensure that the scarcity and value of water is reflected in local prices.

Cost Recovery and Financial Assistance

The policy is for government to gradually withdraw from the financing, development and operation of large water schemes, except where these would have high social values (for example in supporting emerging farmers), where water resources management would be improved by such development, where the water would support social, disaster mitigation or environmental objectives, or for schemes to meet international obligations. New water resources developments should ideally be financially self-sustaining, and should preferably be financed from the private sector. Nevertheless, capital expenditure on major new government water schemes is expected to be approximately R12 billion over the next 25 years (NWRS 2002).

Initially, full cost recovery was seen as a long-term goal of the 1997 water policy, but it has been recognised that this is unlikely to be achievable in a developing country context, except perhaps in certain industrial sectors. Hence, the purpose of the pricing strategy will be to achieve at least partial cost recovery, and to encourage water conservation practices in all sectors of society. A portion of the funding for the establishment and maintenance of the national water management system will always have to come from the central treasury, in addition to specific provisions for financial assistance or the temporary or permanent waiving of charges.

These provisions include the following:

- Where the raw water to meet basic human needs was always intended to be supplied to water services providers free of charge, the inability of many people to pay for the infrastructure and delivery costs even at the basic human needs level led government to announce, in 2001, a policy of providing free basic water, at the level of 6kl per household per month, aimed at the poorest households.
- Water to meet the ecological Reserve does not attract charges, and in theory, government does not have to "buy back" or pay for the water allocated to meet the ecological Reserve (in contrast to the situation in some countries, e.g. Australia). If water is re-allocated for the purposes of meeting the Reserve, this is considered in law to be an appropriation, and no compensation is payable. In the past, the only way to make more water available for re-allocation was for government to buy up farms with their attached water rights.
- All charges for water provided from government water schemes to emerging farmers will be decreasingly subsidised over a five-year period, to allow water users to absorb the price increases gradually.
- Capital cost subsidies will be made available to emerging farmers who are members of WUAs, for the construction of communal water schemes.
- Limited operational subsidies will be made available to WUAs, which take over the operation and maintenance of government water schemes.

Free Basic Water

The implementation of the free basic water policy began in July 2001. Full implementation will be phased in around the country over the next two to three years, since local government capacity to implement the policy varies: in large metropolitan areas it might be possible to implement more quickly than in municipalities with large rural populations. Currently, approximately 26 million people are benefiting from free basic water (57% of the total population). However, the coverage is only 29% within the poor sector of the population (i.e. those earning less than R800 per month). In some areas, the free basic component supplied is as high as 10kl per month; in other areas it is less than 6kl per month, depending on the capacity of the local authority to supply water in a financially sustainable manner (DWAF 2002).

The idea behind the free basic water policy (which is linked to the free basic electricity initiative) is that the very poorest households should be able to get approximately 6kl of water per household per month free of charge. There are several significant challenges associated with this policy. Firstly, many of the poorest households lack access to any formal water services at all, let alone free basic water, so they will not be able to benefit from the policy until water services are extended to them. This explains why free basic water is easier to implement for consumers who are already receiving and paying for a metered supply. It is critical that implementation of the free basic water policy does not lead to a net decrease in revenue at municipal level, particularly in rural areas, and so slow down the extension of basic services to those people who need them most. Secondly, the financial models for providing free basic water while still maintaining financial sustainability at municipality level will need to be carefully designed and tailored for local conditions. Effective targeting mechanisms will be needed which minimise the exclusion of poor people from the benefits of the policy, but which are administratively cost-effective to apply. Thirdly, the free basic water policy must be integrated with any future basic sanitation policy, since if waterborne sanitation is installed this will have an effect on the amount of water used per household.

Presently, the guidelines for implementation (PDG 2001)

recommend three possible approaches to meeting the challenge:

- use of rising block tariffs, whereby users in the higher block pay enough to subsidise the poorest households; this is in effect an internal cross-subsidy at local level;
- targeted credits, using the equitable share grant from national government or internal cross-subsidisation to cover the costs of providing free basic water;
- service level targeting, whereby free basic water could be provided using lower levels of service to minimise costs of delivery (e.g. yard tanks).

In practice, it is expected that each municipality would employ some mix of these three approaches. In the larger metropolitan areas and those with many non-residential water users, rising block tariffs are likely to be the most cost-effective and sustainable way of providing free basic water. Municipalities with large rural populations or few non-residential consumers would probably have to rely on significantly more input from the equitable share grant distributed by national government. Many rural water supply schemes are operated by the Department of Water Affairs and Forestry: these are being transferred to local government, and the subsidies which were received through central treasury allocations to the Department will be transferred to the equitable share grant.

The success of the free basic water policy will rely on the ability of municipalities to efficiently manage and deliver services. Metering, monitoring, leakage control and effective billing and credit control are essentials. However, management capacity is not adequate around the country, and for the smaller, more rural municipalities, the challenges will be significant. In addition, there is some tension between the Department's new policy for bulk raw water pricing and the free basic water policy, since if the cost of bulk raw water increases significantly from current levels, this could make free basic water financially unsustainable for some municipalities (PDG 2001).

CURRENT STATUS OF IMPLEMENTATION

The National Water Act provides for most aspects to be implemented "in a progressive and phased manner", as soon as is practical, since it was realised during drafting that there would be insufficient financial, administrative and technical capacity in the country to implement new legislation and regulations across South Africa in the short term. Implementation will be phased according to a national programme, which has been set out in the first edition of the National Water Resource Strategy (NWRS 2002). From the time of promulgation of the new act in 1998, most routine activities such as operation and maintenance of bulk supply schemes, collection of water-related information, dam safety control and control of water use have continued, although according to new administrative procedures, particularly for allocation and licensing of water use.

National implementation of new regulatory provisions will be on a priority basis. In those areas where there is already a shortage of water compared to the demand, where water quality is already degraded, where there is an urgent need to reallocate water for equity purposes or a need to proactively protect sensitive water resources, the process of transition to the new water management system will be initiated first. In other areas, routine water management activities will continue, largely unchanged, until much later in the implementation programme.

The transition process will involve registration of all existing lawful (and unlawful) water uses, determination of the Reserve and any international obligations, followed by a general call for compulsory licensing, whereby all water users in a designated catchment area (except those served by water services providers, since the water services provider must hold the water use license) will be required to apply for water use licenses under the new act. All applications will be reviewed on the basis of the section 27 considerations (equity, beneficial use, efficiency), and this is when a process of reallocation of water may commence if necessary. Reallocation will proceed gradually, where if a water resource (such as the Olifants River) is already over-allocated once the Reserve has been

determined, all water users will have their allocations decreased by a pro rata amount each year over a period of several years until total water use decreases to a level equivalent to the available, allocable water. Registration of existing water uses is well advanced in most catchment areas around the country, which will allow for at least the financial components of water use charges to be collected in the present financial year. Pilot scale compulsory licensing has already commenced in the Mhlatuze catchment area. Compulsory licensing in the other priority catchments is expected to commence within the first three years after publication of the National Water Resource Strategy in February 2003, and should be completed within 6 to 9 years thereafter. Compulsory licensing in the remaining catchment areas should be completed within a 20-year period.

Establishment of catchment management agencies is considered to be urgent for the Inkomati, Olifants, Breede, Crocodile West & Marico, and Mvoti to Mzimkulu WMAs (NWRS 2002). In several of these, the process of establishment has been ongoing for the last two to three years, and the proposal to establish a CMA in the Inkomati WMA is about to be finalised. The process of establishing a CMA and appointing the governing board is expected to take two to three years in all cases, followed by a five-year period within which the executive structure of the agency will be developed and the necessary technical capacity built, before functions and powers will be delegated to the CMA.

CHALLENGES AND POTENTIAL FOR SUCCESS

The 1997 water policy contains innovative provisions for addressing questions of sustainable water resources management, water scarcity, social equity and economic development, but there are significant challenges associated with implementation of the policy. The potential impacts of the policy in the wider social and economic context, and likely challenges, are discussed in more detail below.

Water Scarcity, Demand Management and Attitudes Towards Water

All indications are that South Africa will reach the limits of potentially accessible water supplies between 2020 and 2030, after which time the available water per capita will decline as the population continues to increase. The impact of the HIV/AIDS pandemic may delay the need for major water resources developments in certain areas by 10 to 20 years, by slowing down the overall rate of population growth, but over the same time period, climate change is likely to exacerbate water scarcity in most areas of the country (Ashton & Haasbroek 2002). There is an additional problem, which is an artefact of the historical and current use of inappropriate statistical analyses to inform the hydrological basis of water resources management: most water allocation decisions are based on the mean annual runoff. In fact, the statistical distribution of annual flows in a semi-arid country such as South Africa is highly skewed towards the lower flows, so that yield analyses based on the mean annual runoff will always overestimate the amount of water available in a catchment. Median annual runoff, which is almost always less than the mean in this country, is a more accurate indicator of the amount of water generated by rainfall within a catchment.

The prevailing attitude of those people who have access to formal water services, and of many bulk users in industry and agriculture, remains one that sees water as cheap and plentiful, whether water resources are used for abstraction of water or for discharge of waste. The country needs to adopt a culture of water saving through the application of demand management policies. There is, however, an aspect that threatens

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Climate change will probably have a much more profound impact than water policy on the commercial agricultural sector during this period, particularly with respect to dryland agriculture, affecting the balance between rangeland and cropland, with associated impacts on food production and jobs in rural areas.

to some extent the implementation of demand management policies, at least in the domestic sector: South Africa is grappling, more or less successfully, with the challenge of providing basic services to the entire population. Once people's most basic needs for food, water and shelter are met, their quality of life should improve. This improved quality of life, along with more diversity in daily activities as energy is freed up from pursuing basic needs, tends to lead to raised expectations of what constitutes "basic" water supply and sanitation, which in turn may require increased expenditure and more water to meet these expectations (MacKay & Ashton 2002). Hence the problem of overall increasing demand for water is not solely one of increasing population growth, but is compounded by rapidly changing patterns of demand on individual water user and sectoral levels.

The National Water Act provides for regulatory as well as economic instruments to achieve changes in water demand patterns, but there are potential limitations on the effectiveness of both. Government does not have the capacity to generally enforce regulatory measures at the individual water user level, and it is unlikely that municipalities, water services providers and catchment management agencies would ever have such capacity either. Successful water demand management will have to rely on a combination of education and awareness, along with self-regulation on a sectoral basis, encouraged by the use of economic instruments. Education programmes are long-term interventions, which require long-term leadership and commitment from government, and which do not show returns quickly in terms of reduced water demand. Economic instruments can be very effective in promoting water efficiency in the industrial and commercial agricultural sectors, but can only be phased in slowly, to counteract the long-standing effects of artificially low water prices in the past without causing significant negative impacts on the national economy in the short term. Economic instruments are likely to be difficult to apply effectively with regard to domestic consumers, since there is such great economic disparity between different sectors of the South African society (Ashton & Haasbroek 2002), and this situation will not change in the short to medium term. Yet, by 2030 water demand in the domestic sector is expected to grow by more than 200%.

The idea of "virtual water" is emerging as a potentially very important strategy for dealing with water scarcity while still promoting economic development (Allan 2002). Virtual water is the water used to produce a unit of a water-intensive product such as wheat. If wheat can be imported to a water-scarce country, rather than grown locally, then the limited local water resources can be utilised in other sectors to produce higher economic returns. To be successful, however, the virtual water concept requires political and economic stability at a regional level. In theory, the South African water policy supports the application of the virtual water concept. However, in practice the neighbouring SADC countries from whom we might import water-intensive products, such as Zambia, Zimbabwe, Mozambique and Angola, are not yet stable enough to meet our needs with adequate assurance, and will have their own water scarcity problems to address in the coming years as climate change begins to take effect. In addition, the tendency for most post-colonial governments in Africa to insist upon striving for food self-sufficiency is likely to limit the widespread use of virtual water in the SADC region in the medium to long term.

Under pre-1994 governments, much marginal land was opened up for irrigation farming, which was made possible due to the highly subsidised cost of irrigation water from government water schemes.

AGRICULTURE AND THE LAND ISSUE

Commercial Agriculture

In terms of potential reduction in water allocations, increasing input costs and loss of previous rights, the commercial agricultural sector is arguably one of those most significantly affected by the new water policy and legislation. Precisely what the medium- to long-term economic impacts of the water policy will be within this sector is still unclear, since comprehensive economic modelling was not undertaken prior to or during the policy development phase (Rowlston pers. comm.). However, there is considerable potential for water savings and more efficient water use within the sector, especially as regards irrigation, in response to higher water prices and lower water allocations. Savings can be effected not only through use of more efficient technology for application of water on crops (e.g. changing from overhead sprinklers to drip or microjet irrigation, and lining of canals) and implementation of irrigation scheduling practices, but also through changing to more water-efficient crops or crops with a higher cash return. A national strategy for water demand management and water conservation has been prepared, with an associated sectoral strategy for agriculture.

The use of water to irrigate marginal land in the land reform process is questionable, and may in fact contribute to lack of sustainability of some land reform initiatives at the local level.

World grain prices remain artificially low due to domestic agricultural policies in Europe and the USA. The agreements reached at the recent World Summit on Sustainable Development in Johannesburg show little potential for changing this situation. There is a possibility that increased input prices due to increased water costs might affect the viability of irrigated maize and wheat production within South Africa, particularly on marginal land, for both the domestic and export markets. This could have an impact on domestic food security, but the potential impact needs to be quantified to assess whether it would be significant.

One of the arguments against abolishment of riparian rights during the debate around the Water Law Principles of 1996 was the potential negative impact on agricultural land prices if water rights were no longer tied to land. A detailed survey has not been undertaken to identify whether this impact has materialised in the initial stages of water policy

implementation, but indications are that there has been little immediate effect on land prices due to the water policy specifically. During the policy drafting process, discussions were held with major financial institutions. They were comfortable that the maximum period for water use authorisation of forty years was more than sufficient security for lending purposes. In addition, in law a water use license is a license in respect of the land on which the water is used, rather than the individual license applicant (NWA 1998), thus providing additional security.

In general, significant short-term impacts on the agricultural sector as a result of water policy implementation are not expected by the Department of Water Affairs and Forestry (Rowlston pers. comm.), other than enhanced water savings and possibly some decrease in agricultural activity as water use shifts to higher-value sectors such as industry. The policy of government to not support major new irrigation projects means that irrigation water demand nationally is not expected to grow significantly over the next 20 years (Rowlston pers. comm.; NWRS 2002). Climate change will probably have a much more profound impact than water policy on the commercial agricultural sector during this period, particularly with respect to dryland agriculture, affecting the balance between rangeland and cropland, with associated impacts on food production and jobs in rural areas.

Subsistence Agriculture and the Land Reform Process

Currently, basic human needs are defined as 25 litres per person per day or around 6kl per household of 8 people per month. Although this is less than the WHO standard of 50 litres per person per day, it is sufficient water for drinking, cooking and personal hygiene, but might in most cases be insufficient to support irrigation or watering of subsistence crops. Opinions vary about whether water for subsistence agriculture should be included in the basic human needs allocation, and if so, how this could be made financially sustainable. Schedule I (NWA 1998) provides for "reasonable domestic use", which could be considered to include watering of a domestic food garden but which would not be applicable if food were being produced for even small-scale commercial purposes (Schreiner pers.

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comm.). The issue of the provision and financing of water for subsistence agriculture is likely to be resolved on a case-by-case basis, since no clear policy directives are currently available.

A potential problem area is that of the linkage between water policy and the national land reform process. The linkage at present is relatively loose, with co-operation between the relevant government departments being low-key at best. The present land policy relies on freeing up land for redistribution on a willing-buyer, willing-seller basis. Under pre-1994 governments, much marginal land was opened up for irrigation farming, which was made possible due to the highly subsidised cost of irrigation water from government water schemes. It is this marginal land which is most likely to become available for redistribution first: marginal land requires significant input of fertilisers and other agro-technology to ensure financially viable and sustained yields, which may not be feasible for small farmers who are settled on such land without substantial technical and financial support. The use of water to irrigate marginal land in the land reform process is questionable, and may in fact contribute to lack of sustainability of some land reform initiatives at the local level. In some arid and semi-arid areas, the scarcity of water will make it extremely difficult and expensive to provide some (let alone enough) water to support the land reform process. In such cases, it is arguable whether the water will really generate the intended social and economic benefits in the target communities, or whether these benefits could better be generated by the allocation of water to alternative, higher-value uses.

Governance, Capacity and the Public Trust

The ultimate success of the 1997 water policy is likely to rest not so much on economic and technical issues, but more on the capacity to develop and implement good governance systems. All the necessary tools have been provided in policy and legislation to promote transparency, to ensure that power over the allocation and management of water does not become concentrated in the hands of the political elite, and to ensure that all people of the country have equitable access to water and the benefits that water provides, including improved health and economic development. The

specifications in the National Water Act regarding public consultation on matters of policy and regulation, the provision for a Water Tribunal, and the provisions for the establishment and operation of Catchment Management Agencies are all positive signs of political willingness to implement the policy according to the spirit and intention of both the Water Law Principles and the national Constitution. However, only time will tell how far that willingness extends, since no CMAs are yet in the position where powers and responsibilities could potentially be delegated to them.

Ensuring that government acts in the public trust is the responsibility of civil society, through the formal channels of parliament and through civil society organisations acting in a watchdog role. South Africa has a history of strong civil society involvement in the movement for social change, but where water is concerned, civil society is not as well organised nor as well informed. It will be the task of government to support particularly marginal groups, to ensure that their capacity to interact and participate in water management decision-making is enhanced and that their interests are not prejudiced by those of better-organised, more technically competent consumers, such as the agricultural unions and the industrial sector.

Overall, implementation of the national water policy relies on the vision, understanding and commitment of only a handful of individuals in key positions in the water sector.

Careful attention will need to be paid to financial management and reporting. Presently, CMAs are subject to public financial management procedures, but do not fit easily into the Public Finance Management Act. The status of CMAs must be clarified with the National Treasury, to ascertain how revenue will be collected and disbursed. Until CMAs are established, the Department of Water Affairs and Forestry will collect the revenue from water use charges, and will manage and disburse this revenue through the trading account of the Department. There remains a need to allow for transparent "ring-fencing" of revenues collected via water use charges, so that revenue collected from, say, waste discharge charges, is fed directly back into improving and supporting protection of water resources.

Human resource capacity within government and the CMAs will probably be a critical limiting factor in achieving successful policy implementation. It appears unlikely that policy implementation will be

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completely successful around the country: what is more likely it that there will be pockets of more or less success, depending on whether a critical mass of technically capable people and resources is available to implement the policy in any single area. At present, the Western Cape appears to have the best potential for success, due to the relative strength of the Western Cape office of the Department of Water Affairs and Forestry, and the strong commitment of the City of Cape Town to sound catchment management and water management practices.

Overall, implementation of the national water policy relies on the vision, understanding and commitment of only a handful of individuals in key positions in the water sector. Capacity building initiatives have not been and do not promise to be successful in addressing this problem in the short to medium term, which makes the policy implementation process very vulnerable.

International Obligations

South Africa has, in the past, signed a number of bilateral and multilateral treaties and accords in relation to river basins that are shared with neighbouring countries. In general, however, South Africa's relative strength has meant that downstream countries have tended to get whatever we left to them after our own internal water demands were met. The National Water Act is unusual in that it specifically mentions the need to meet international obligations, and the policy establishes a hierarchy in which international obligations, in terms of both quantity and quality of water, have a higher allocation priority than local water uses. However, most of our transboundary river systems, such as the Crocodile East, Olifants East, Limpopo, Orange, Pongola/Maputo and Incomati, are heavily utilised already. Freeing up enough water to meet South Africa's needs for the Reserve as well as the needs of users in downstream countries, let alone ecosystems in downstream countries, is likely to involve a long and difficult process of negotiation and planning.

The policy and legislative environments strongly support sustainable, equitable management of water resources in South Africa. However, the willingness to fully implement the provisions of the National Water Act may be reduced, should initial social and economic impacts prove to be negative. There is a need for more quantitative studies of the potential medium- and long-term socio-economic impacts of policy implementation across all related sectors, in order to allow for the water policy to be critically reviewed and refined as implementation proceeds. The same could be said of linked policies in other sectors such as agriculture, environment and local government.

The long term success of the national water policy will depend on strong, sustained and consistent leadership from people who have the breadth of vision and strategic thinking ability to guide the implementation process through the difficult first stages, and through the inevitably uncomfortable workings out of the policy within the water sector and in other related sectors such as agriculture, industry and environment.

Unless the capacity building issue is addressed as a critical national priority in the water sector, chances of long term success in implementation will be very limited.

CONCLUSIONS

The long-term success of the national water policy will depend on strong, sustained and consistent leadership from people who have the breadth of vision and strategic thinking ability to guide the implementation process through the difficult first stages, and through the inevitably uncomfortable workings out of the policy within the water sector and in other related sectors such as agriculture, industry and environment. This is not an issue of transformation in the management levels of the water sector: it is simply that there are far too few people of any colour with the necessary capability, and of the people who remain in the public sector, most are carrying far too much responsibility for their levels of experience and expertise. The quality of decision-making will suffer, even though the decision-making tools themselves, as provided in policy and legislation are more than adequate to the tasks ahead. Unless the capacity building issue is addressed as a critical national priority in the water sector, chances of long-term success in implementation will be very limited. In the short to medium term, working partnerships with private sector organisations such as those in industry, mining and agriculture could help to alleviate the shortage of skills, information, expertise and resources, but this will require radical re-thinking of relationships and ways of doing business between government and the private sector in relation to water. Fully functional CMAs can serve as vehicles for such partnerships, so it is also critical that the CMA establishment process is successful.