



Implications of productive water needs on water resources

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THE WATER SECTOR in South Africa is currently going through a period of major change and reform. This has profound implications for both water management and water services in rural and urban areas. The recent National Water Act (RSA, 1998) has established the basis for management of water resources on a catchment basis (for equity, efficiency and sustainability), and the Water Services Act (RSA, 1997) aims to ensure everybody has access to basic water supply and sanitation services.

Against this background, water use clearly needs to increase to meet people's needs and to help raise standards of living. More water is required not just to meet basic needs for drinking, washing, cooking and sanitation (an amount of 25 lpcd is recognised – the so-called 'RDP' minimum) but also to promote productive uses of water at the household level, and village-based enterprises including small-scale irrigation.

The contributions to rural incomes, food security and the wider economy from small-scale irrigation are widely acknowledged, but the contributions to livelihoods of water use for productive activities at the household level, and for normally 'informal' village-based enterprises are rarely considered. Productive water use at the household level includes activities such as backyard irrigation, beer brewing, dairying, brick-making and construction. These have been shown to have important economic, nutritional and other benefits (e.g. improved shelter) for poor communities in dryland areas (see Box 1). Other village-based enterprises include activities such as community gardens and raising poultry. These productive activities must be better recognised in order for rural water supply (RWS) to become more demand-responsive (Moriarty, 2001)

However, productive uses of water at the household level over and above basic needs are not explicitly recognised in policy. Since the National Water Act clearly recognises water for the agricultural sector, a mechanism for improved allocation of water to emerging farmers exists. But other productive uses of water are largely invisible – the sector is largely informal, fragmented and lacks representation – and the false assumption is often made that domestic water is only required and used to meet domestic needs such as drinking water, washing and cooking. The Water Services Act also focuses on meeting basic needs for water supply. Until policy changes, water is unlikely to be allocated for such productive uses at the household level on a wide scale.

The current changes and trends raise some interesting questions. How can the needs for water to support rural

Box 1 Productive use of water

A study in the Bushbuckridge area, South Africa (Perez de Mendiguren, 2001) showed

- high-levels of water use for economic activities in villages, with both poor and good water supplies, ranging from 23 lpcd to 40 lpcd above the amount used for basic needs (21-22 lpcd).
- economic returns are relatively high, ranging from 0.01-0.02 R/l for vegetable gardens and fruit trees (the most common use of 'extra' water) to 1.2-1.6 R/l for beer brewing and ice block making. (1R=£0.09)

livelihoods be articulated (to achieve policy changes) and supplies improved to promote productive water uses (given technical, economic, resource and other constraints)? Where will additional water resources for productive water use at the household level (and small-scale irrigation) come from? And, how can experiences in some other countries (such as India) where rapid increases in groundwater use for small-scale irrigation have compromised domestic water availability, be avoided? (Butterworth *et al.*, 2001).

This paper explores these issues focusing on the allocation of water resources to the rural water supply sector and participation in these decisions. It focuses on the Sand River Catchment where a national pilot project for integrated catchment management (the Save-the-Sand project) is underway.

Sand river catchment

In the Sand River Catchment most of the existing surface water resources are already utilised (Pollard *et al.*, 1999), and any increased use for previously marginalised sectors and communities will need to be met through: groundwater development; reduced use in other sectors or areas; or transfers from outside the catchment (construction of a new dam has made basin transfers possible). Competition for scarce water resources and inappropriateness of priorities in water use have been widely recognised since the 1992 drought. Tankers had to be used as an emergency water supply to rural communities and large numbers of wildlife and livestock died, while irrigated agriculture utilised water without restriction. This crisis acted as a catalyst and stimulus for an integrated approach to water resources management to be adopted.

The catchment (1910 km²) is located in the north east of South Africa draining parts of Northern and Mpumalanga Provinces. It is part of the larger Sabie and in turn, Inkomati Catchments. Important land uses - roughly from the upper to the lower parts of the catchment - include plantation forestry, dryland and irrigated agriculture, relatively dense rural settlements (a legacy of the apartheid system), game reserves and the Kruger National Park towards the Mozambique border. It is a relatively dry area, but water scarcity for the majority of the population has been exacerbated by the political and social engineering of the apartheid government. As a result, 44% of the population were estimated to have supplies below government minimum levels (25 lpcd of potable water from a standpipe within 200 m of each household) (Pollard & Walker, 2000).

Water resource allocation and use

Currently there are no active water allocation mechanisms in the Sand River Catchment. *De facto* 'allocation' is determined by current water use patterns (although water users had to register from mid-2000 in order to regularise existing use) that remain poorly understood. A moratorium is in place on any allocations to new users. The largest water user is the irrigation sector (estimated as 32.3 Mm³ in 1985). This includes both irrigated plantations of citrus, coffee and mango, and small-scale irrigation (mainly field crops). Forestry (mainly exotic species such as pine) in the upper parts of the catchment is another large water user (11.3 Mm³ in 1985). Domestic water use (to meet minimum needs only) in comparison is estimated to account for 3.5 Mm³ (1998 estimate). However, when actual water use for basic needs and household productive uses are taken into account, the real water use from 'domestic' water supply systems may well be two to three times greater. Also, at a village-scale domestic water needs can account for a large proportion of the yield from local aquifers, and during droughts needs may equate to a much larger share of the available resources than during normal years. Finally, the environment and river flows to Mozambique are also important components of the catchment water balance.

Some of the reasons why domestic water use represents only a small component of the overall water balance are: water resource constraints (e.g. upstream use impacting on downstream users); poorly planned infrastructure; and inadequate operation and maintenance. These factors result in actual domestic water use being much lower than need. However, this relatively small component of the water balance is obviously of vital importance.

In the Sand River Catchment, surface water resources are heavily utilised, but groundwater has not yet been fully developed. Historically, investment in rural water supplies has focused on extensive bulk water supply systems utilising surface water resources (relying upon large dams, treatment works and distribution networks). But in many cases, the planned reticulation systems have never been completed. Current RWS efforts, implemented by govern-

Box 2 Establishment of Catchment Management Agencies (CMAs)

The National Water Act has abolished riparian rights, established a Reserve for human needs and the environment, and recognised water as a social and economic good. CMAs are being formed to manage water resources based upon a catchment management strategy. One of the key tasks will be to allocate water to different users, and this is intended to be more equitable, efficient and sustainable than past patterns of use. They are intended to promote participation and be more demand responsive. A proposal for an Inkomati CMA (including the Sand), based upon an extensive consultation process has been completed (DWAF, 2000). However, it remains uncertain how quickly such structures will take to be established – perhaps as long as 7-15 years.

ment and non-governmental organisations such as the Association for Water and Rural Development (AWARD), are more focused on local (i.e. single village or sub-village) groundwater-based schemes. Resource use for RWS is now perhaps evenly split between surface and groundwater.

Despite the vast improvements in water supply to the rural sector made by the South African government, many of the current patterns of water use are still characterised by inequality, inefficiency, and inadequacy. The poor remain marginalised, and emerging farmers and poor rural communities have limited access to water resources while water continues to be used inefficiently by an irrigation sector with few incentives to improve its water use efficiency.

Important changes are now made possible by the abolition of riparian rights, and the planned licencing of water users based upon criteria that promote equality, efficiency and sustainability (Box 2). One key new concept is the Reserve; a theoretical minimum quantity designed to ensure the availability of water for human needs and the environment. The implications for rural water supply are still emerging, and it remains unclear how the component for human needs will be operationalised and managed. For example, initial attempts in the Sand River Catchment simply estimated domestic water needs based on population, but improved approaches will need to account for losses in distribution, and carefully consider where and how the Reserve is made available. Theoretical availability of sufficient water at one point in the catchment (e.g. in a river) will have little relevance for water supply systems that are not connected to a reticulation system to transfer bulk water around the catchment, or for settlements dependent on a groundwater supply. In addition the new allocation process must address temporal issues such as droughts (the Reserve will need to be utilised during droughts and re-established during wet periods), and the potential future development of groundwater for small-scale irrigation.

As explicitly recognised in current government policy, one important factor that will influence the future allocation of water for the rural water supply sector will be the participation of key stakeholders (e.g. local government and consumers, NGOs and other institutions that take responsibility for advocating the rights of the poor and marginalised) in the emerging catchment management fora.

Participation in water resource allocation

While the RWS sector has been actively promoting participation in the management of rural water supply systems, improving participation in water resources management (which has to happen at a larger catchment scale) is a relatively new challenge for the sector. Recent efforts have actively promoted participation of the RWS sector in catchment management and used these lessons to develop guidelines (DWAF, undated; DWAF, 2001).

There are important differences between avenues for representation of the interests of the RWS sector, dependent upon on the type and scale of water supply systems. Smaller-scale systems (usually groundwater-based and serving part, one or a small number of villages) will be represented through local government. The water resource needs of consumers served by multi-village bulk water supply schemes (surface water) will also be represented by water boards (e.g. the Bushbuckridge Water Board in the Sand River Catchment) with collective muscle. Most attention is currently focused on these latter systems (i.e. surface water), although groundwater-based systems may supply just as much water.

Some emerging lessons from the Save-the-Sand Project (that includes community water supply and improved allocation of water at a catchment scale amongst other activities) on achieving participation include:

- the high-costs of participation;
- difficulties in working closely with local government (i.e. lack of capacity) where personnel (and in the current period, roles and responsibilities) change frequently;

Box 3 Water, Households and Rural Livelihoods (WHIRL) project

AWARD is currently undertaking research in the Sand River Catchment on the issues raised in this paper. This work is being carried out as part of the WHIRL project involving partners from South Africa, India and the UK. The focus is promoting access of the poor to sustainable water supplies for domestic and productive uses in areas of water scarcity - with particular emphasis on water resources issues and catchment management. Further details about the project can be found at <http://www.nri.org/WSS-IWRM/>

- the need to recognise fragmented or marginalised stakeholders and uses that can be too easily overlooked – for example, productive water uses of domestic water has up to now been a largely invisible sector; and,
- the requirement for a good and even knowledge base for all stakeholders to participate effectively. ‘Platforms’ need to be created where very different stakeholders can communicate effectively.

The water resource future for rural water supply

On paper, the water resource future for the basic needs element of rural water supply in the Sand River Catchment and elsewhere in South Africa is secure. Strong legislation, incorporating innovative elements such as a Reserve that provides for human needs and the environment, and plans for better institutions and structures are now in place.

However, a number of caveats must be made:

- experiences elsewhere (e.g. groundwater legislation in India) have shown that legislation can be ineffective and hard to implement,
- regulatory approaches to water resource allocation will require high levels of capacity in the catchment management bodies,
- corruption has proved a major weakness to such approaches in other countries, and
- institutional inertia and capacity limitations (especially at local levels) are also major constraints. In this respect, NGOs and NGO associations could play a stronger role in the implementation of the new policies.

Importantly, whether more water will be available for productive uses within the household and for village-based enterprises is uncertain and remains to be addressed. The RWS sector must engage with these issues to ensure that water allocations for productive uses (over and above basic needs) can be realised, and that basic needs are protected (at the lowest possible cost) in practice as well as in principle.

Acknowledgements

The WHIRL project (Box 3) is supported by the UK Department for International Development (DFID) through the Infrastructure and Urban Development Division’s Knowledge and Research programme. Project R7804 ‘Integrating drinking water needs in watershed projects’. Comments on a draft of this paper by Patrick Moriarty and Charles Batchelor are acknowledged.

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- Please reference this paper as:
Mokgope, K., Pollard, S., and Butterworth, J. 2001. Water resources and water supply for rural communities in the Sand River Catchment, South Africa. Paper prepared for the 27th WEDC Conference, *People and systems for water, sanitation and health*, Lusaka, Zambia, 20-24 August 2001.
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