

824 ZA99



International Water and Sanitation Centre

P.O. BOX 2869, 2601 CW DELFT, THE NETHERLANDS

Library

IRC International Water
and Sanitation Centre
Tel.: +31 70 30 688 80
Fax: +31 70 35 888 64



THE
MVULA

TRUST

824-ZA99-15454



Supporting Water and Sanitation Development

Promoting Sustainability in South Africa: Broadening Our Options

Edward D. Breslin
Health Manager

Bethuel Netshiswinzhe
M&E Manager

**Paper Presented at STRAP Workshop
12 April 1999**

LIBRARY IRC
PO Box 93190, 2509 AD THE HAGUE
Tel.: +31 70 30 689 80
Fax: +31 70 35 899 64
BARCODE: 15454
LO: 8242A99

1. Introduction

Access to clean water supplies and hygienic sanitation facilities has been racially and geographically skewed in South Africa. In 1994, the newly elected Government estimated that more than 12 million South Africans lacked access to clean water and 21 million were without hygienic sanitation facilities (DWAF 1994). The overwhelming majority of people without such services are black and live in rural areas of the country.

The South African water supply and environmental sanitation sector has made significant progress in redressing these imbalances since 1994. Potable water has been delivered to an estimated 3 million South Africans in this short period of time. This considerable achievement has, in many respects, propelled the water supply sector into the forefront of development delivery in the country.

The South African water sector is also praised in local and international circles for its progressive policies. The passage of the Water Services Act of 1997 is only the most recent example of world-renowned policy and legislation from the South African water and environmental sanitation sector.

And, despite the slow rate of delivery in the sanitation sector, there is broad recognition that the approaches promoted by government, with its emphasis on health rather than infrastructure, is appropriate.

Despite these considerable successes, anxiety is mounting about the sustainability of recently completed schemes. Are the projects supported by the sector and inherited from previous homelands since 1994 financially and technically viable? Will the estimated 3 million people who have benefited from the new government's water policy still be using these schemes in 5-10 years? If not, what can be done to address sustainability problems at project level?

These questions are particularly pertinent given the changing institutional environment within which future water supply and sanitation programming will undoubtedly operate. The management of existing water supply and sanitation schemes will become the responsibility of local government. The danger is that local government will inherit unviable projects that will undermine their capacity to address infrastructure backlogs in their areas. Unsustainable projects may become a considerable drain on already scarce local government financial and human resources, and may further undermine local government's capacity to service those who still wait for clean water and adequate sanitation.

The South African water supply and environmental sanitation sector therefore finds itself at an important crossroads. Responsibility for water supply and environmental sanitation is rightly shifting from the Department of Water Affairs and Forestry (DWAF) to District Councils throughout the country. The way in which these Councils will approach existing and future water supply and sanitation is uncertain. Linked to this is the reality that financial support for future schemes is also uncertain, and ongoing financial support for project level O&M is unlikely to continue, especially at the current levels of subsidization. The harsh reality is that the call by many water sector practitioners to use local

government's "Equitable Share" to sustain inherited water projects is falling on deaf ears in most District Councils.

The future of environmental sanitation programmes is also in doubt as arguably the key component of the previous programme – the household subsidy – is being eroded due to financial constraints in the sector.

The challenge facing the sector is therefore relatively clear – how can South Africa promote sustainable water supply and environmental sanitation development in an environment of enormous need, declining and uncertain finances and changing institutional roles and responsibilities?

This paper provides some initial suggestions on how this challenge can be met in South Africa. "Answers" are not provided. Instead, the paper offers some suggestions on what water and environmental sanitation practitioners may want to think about when designing and implementing projects in this uncertain environment and in partnership with local government. The evidence to support the arguments of this paper are taken from local and international experiences in sustainable water supply and environmental sanitation, and from insights gleaned from recent "Revisiting Schemes" evaluations completed in South Africa (Breslin 1999a).

It should be stressed at the beginning that this paper is primarily concerned with sustainable rural water supply and household-level environmental sanitation issues at project level. Reference is also made to peri-urban situations, but this is not the prime focus of the paper. Water and environmental sanitation issues in urban areas will not be covered, although some of the key sustainability lessons may apply in an urban context as well.

The paper begins with an overview of sustainability in the water supply and environmental sanitation sector. This paper will highlight some of the common principles of sustainable water supply and environmental sanitation that are generally contained in definitions of sustainability for sector-based work.

The following section explores innovative ways in which communities and development agencies, both locally and internationally, have promoted sustainable water supply and sanitation in uncertain financial and institutional settings. This section is by no means comprehensive but does offer a range of ideas and experiences that may help inform future water supply and environmental sanitation programming.

The final section of the paper takes a programmatic viewpoint of sustainability, and provides concrete suggestions on how to improve the likelihood of project level sustainability through outcomes-based programming and effective monitoring and evaluation (M&E).

2. Sustainable Water Supply and Environmental Sanitation

Definitions of sustainable water supply and sanitation abound.¹ Funding proposals often have a greater chance of being supported by donors if the term sustainability is used regularly throughout the text. Conferences on water and sanitation often focus on sustainability, assuming the concept is clear and universally understood.

In South Africa, the term sustainable has tended to focus on issues of cost recovery above all else (see, for instance, Breslin 1998b and DWAF 1998a). And while cost recovery is an important element of sustainability, it is by no means the only component worth considering.

The plethora of definitions on sustainable water supply and sanitation do however share a number of common characteristics. Characteristics that are applicable to both water supply and environmental sanitation include:

- **Benefits** – the potential benefits of improved water supply and sanitation are considerable. Benefits could include improved access to clean water for domestic and productive purposes, community and household health improvements, reduced workloads for community members responsible for household water management, income generation, agricultural production, and animal husbandry. Households often have a clear vision of how improved water supply and sanitation systems can benefit themselves and their broader community. Sustainable projects are most often those that continue to meet these perceived benefits over time.
- **Time** – water supply and sanitation systems are designed to meet local needs and demand over a prolonged period of time. The actual time a system is operational will obviously vary based on a range of factors including but not limited to system technology and environmental conditions.
- **Reliability** – sustainable systems provide a continuous service over time.
- **Maintenance** – a continuous service can only be provided if the systems are kept in working condition throughout the life span of the facility.
- **Utilization** – facilities should be used for their intended purposes, by all potential consumers, throughout the life of the system. For instance, a toilet that is only used by women and children will not achieve its full health impact unless men also use the facility. The impact of handwashing on household health will only be realized if all members of the household wash their hands after defecation and before handling food. Water collection points can become health hazards if stagnant water accumulates, or if people wash their clothes at a borehole site when the system was not designed to accommodate this local requirement.
- **Finance** – water supply and sanitation systems require initial and recurrent finance in order to ensure their on-going operation. The technological and management systems chosen at local level must, in the end, “be within the

¹ See, for instance, WASH 1993: 99; Noppen 1996: 20; Roark *et. al.* 1992: 5; DWAF 1998b: 4; Wehrle 1998: 22; Davis and Brikké 1995: 6.

financial means of whoever will bear the cost" (WASH 1993: 112). As will be discussed below, costs include capital costs, operation and maintenance costs and replacement costs. Consideration is increasingly being given to issues of upgradability as well.² The sources of the finance required to sustain a water supply and environmental sanitation system can vary, ranging from cost sharing arrangements with a government institution to full cost recovery from consumers.

- **Environment** – environmentally sustainable development has become an increasingly important consideration in development planning. The Brundtland Commission argued that sustainable development can only be ensured if it "meets the needs of the present generation without compromising the needs of future generations" (World Commission on Environment and Development 1987). In terms of water supply, this means that "the water consumed is not over-exploited but naturally replenished" (Davis and Brikké 1995: 6). In terms of sanitation, this means that sanitation systems do not contaminate the environment, including the groundwater supply. In terms of environmental sanitation, this means addressing issues such as solid waste management, wastewater management and environmental cleanliness.

Definitions that are concerned solely with sustainable water supply also tend to focus on issues of water **quantity** and **quality**. In short, this means that improved water supplies should produce the amount of water required at local level **and** for which the system was designed over time. The improved water supply should also be of an adequate quality to promote good health and dissuade people from using unprotected sources of water for drinking and cooking purposes.

Recent research strongly suggests that health improvements, in terms of nutritional well being and reductions in child morbidity, is most pronounced when improved water supplies are linked to improved sanitation. More importantly, this research suggests that the health impact of improved water supply is limited when **not** linked to improved sanitation, and that increased quantities of water at household level have a greater impact on health than improved water quality.³ Consequently, international agencies are placing greater emphasis on linking water supply and environmental sanitation initiatives at the start of a particular project.

Finally, a growing development trend is to place sustainability of a sector-specific intervention – like water supply and sanitation – within the broader context of poverty reduction. Progressive water supply and sanitation projects are increasingly linked to broader poverty reduction considerations that "increase the economic and social well-being of the poor" (Pal 1998: 457). Unfortunately, water supply and sanitation projects are most often implemented

² *Waterlines* Vol. 15, No. 3, January 1997 is devoted to the issue of upgrading existing water supply and sanitation systems.

³ See, for instance, Esrey 1994 and 1996; Berger and Esrey 1995; and Gosh 1999.

in isolation of other developmental possibilities and constraints. Improved water supply and sanitation systems often fail because communities cannot afford to pay for the provided service over time as the O&M costs escalate beyond the limited (and often stagnant) incomes available at local level. As will be demonstrated below, innovative ways exist that link improved water supply and sanitation to poverty reduction. The spin-offs of such interventions can be considerable if practitioners can move beyond the limited viewpoint of water provision for domestic consumption.

The following section provides some concrete examples of how these principles can be integrated into current and future water supply and environmental sanitation interventions.

3. Enhancing the Prospects for Sustainable Water Supply and Sanitation in South Africa – Lessons from the Field

There is considerable evidence to suggest that water supply and environmental sanitation projects in South Africa are unsustainable.⁴ Cost recovery is extremely low throughout the country. Subsidies for operation and maintenance support have, in many cases, kept projects running since completion. These subsidies are being withdrawn, threatening the viability of many schemes. Efforts to enforce payment, through technologies like pre-paid meters, have consistently resulted in lower consumption at project level, vandalism and the exclusion of many poor families from the benefits of the new water systems.⁵ The problem of cost recovery is exacerbated by a profound lack of political will to collect funds in many villages.

Poor training in financial management, which tends to focus on training an individual rather than broadening local level financial management capacity, is also hampering cost recovery. Innovative ways to collect funds from often-dispersed populations have not been considered. The capacity of committees to recalculate tariffs as required (due to an increase in diesel for instance), to deal with short-term cash flow problems, or to support families that simply can not afford to pay for water services is weak.

The health impact of new water supply and sanitation projects has not been realized. Constant breakdowns, contaminated water at tap level and poor O&M are all contributing to poor health at water supply project sites. Sanitation projects have largely been infrastructure-based, while health and hygiene education components are weak, underfunded and uninspired. The Department of Health's limited involvement in the sector is also extremely problematic.⁶

⁴ See, for instance, Breslin 1998a, 1998b and 1999; Dreyer 1998; DWAF 1998a and 1997; and Wehrle 1998.

⁵ See, for instance, the evaluation of Shemula in DWAF 1997; and Breslin 1999a.

⁶ See Breslin 1998c. Environmental Health Officers (EHOs) have been involved, to varying degrees, in the South African water supply and sanitation sector. The best example is in the Eastern Cape, where the Provincial Department of Health allocated 55 EHOs to the sanitation sector. Unfortunately, this model has not been replicated in other Provinces. Water supply and sanitation are cornerstones of any primary health care strategy. This fact seems to be lost on

The South African environmental sanitation sector has been hampered in a number of ways as well. First, sanitation projects have suffered from erratic funding arrangements. Projects are started, then stopped, then started again, thus causing great confusion on the ground. Second, household sanitation requires considerable work and time. Funding agreements have not recognized this reality. Third, the sector's insistence (in reality if not intent) on Ventilated Improved Pit (VIP) latrines as the standard has meant that sanitation has proven to be extremely costly for many households on the ground (Breslin and Mutshinya 1997). This problem has only been exacerbated by the insistence of many project agents in importing industrial-quality materials to construct these facilities. Sanitation had, despite its design, turned into a toilet building operation.

The evaluations also suggested that poor pre-planning work at village level, combined with almost non-existent M&E, has contributed to the sustainability problems of the sector. Projects were rushed through to meet unreasonable delivery targets, and problems that emerged were not addressed because M&E systems were not operational.

Finally, communication problems at project level are undermining project sustainability. Community members often complain that they do not understand how the tariff is calculated, or how much money is being collected in a given month. Communities are uncertain about how their tariffs are used and whether there is any surplus money in the treasury. Most importantly, the reasons for system failure are a mystery to many at project level. Poor communication is leading to distrust and anxiety at local level, and consequently undermining project viability.

These problems are not unique to South Africa. The challenge is to design innovative ways to address these problems so that the full potential impact of improved water supply and sanitation can be realized at project level. It is to these challenges that we now turn.

3.1 Participatory Water Supply and Environmental Sanitation

Despite the overwhelming international consensus on the value of participatory programming over top-down planning, the reality is that most development work remains top-down and externally driven. The South African water supply and sanitation sector, like many, employs the rhetoric of community participation but rarely matches this rhetoric with reality.

Part of the problem relates to terminology. To some, participation means little more than consultation. For instance, DWAF's "Sustainability Management Guidelines" (DWAF 1998b) uses the term "participation" quite regularly throughout the document. Yet, the document suggests that participation, in practice, means developing "Area Plans" with key leaders and consultants.

the Department. EHOs should not, in the end, be the only health sector actors involved in community water supply and sanitation.

Communities are informed of the decisions taken on their behalf (i.e. they participate). To others, participation in construction is adequate.

In contrast, many argue that participatory programmes are those where people on the ground are in control of their development from the start of a "project" to its completion. External advice, finance and even guidelines are secondary to local needs and realities.

Participatory approaches to development will therefore only work if all role players actually believe that people, regardless of age, sex, educational background, socio-economic status and history, can actually solve their own problems. Participatory planning can only flourish if "experts" accept that they do not have all the answers, that they can learn from people (even illiterate people), and that the final development choices made may be contrary to what the "expert" would have recommended. Participatory programming only blossoms if facilitators understand that one group of people (like a water committee) cannot possibly speak for an entire community, even if they were elected as a representative body.

The most effective participatory programmes are those that seek out the views, opinions and ideas of all stakeholders rather than relying on the views of a select few.⁷ The most challenging aspect of participatory programming is accommodating the multiple and competing ideas and strategies within a cohesive framework or plan.

Participatory water supply and environmental sanitation generally focus on a range of sector-relevant issues, but do not predetermine their outcomes.

⁷ While it is obviously impossible to talk to everyone, participatory programmes actively work with groups like unemployed men, unemployed women, pensioners, children of various ages, women with children under 6 years, formal and informal health care providers, church and civic leaders, breadwinners in the household, and formal and informal business people in the community. These different groups of people will often have differing views, and differing development options. Planning based on these differing realities is complex but critical for sustainability. Neglecting differing "voices" or contending strategies at local level leads, in most cases, leads to considerable problems in the future.

Measurable Impact of PHAST in Africa

In Kenya, an evaluation of a recent cholera outbreak found that areas involved in participatory water supply processes (like the SHEWAS Project) were least effected nationally.

In Zimbabwe, handwashing facilities constructed by households are now commonplace, whereas in the past they were almost non-existent. A recent evaluation suggested that the reason for this was the use of PHAST in the field.

In Uganda, a PHAST-based urban programme saw a dramatic increase in user payments for water supply, and an increase in the numbers of latrines constructed and maintained properly.

In a PHAST-based peri-urban project in Kenya, there was a decline in diarrhoeal diseases reported to clinics and a corresponding increase in the implementation and utilization of hygienic sanitation facilities.

In Aduwa village (Kenya), sanitation coverage has increased from 30% to 80% since the start of a PHAST project.

Sources: NETWAS 1998a; IWSD 1994.

So, for instance, many programmes and agencies integrate participatory water supply, hygiene education, sanitation, facility management and capacity building in all of their supported projects. How these parts are integrated, and what shape they take in terms of technology choice, institutional roles and responsibilities, and actual behaviour changes chosen will only be decided through field based work.⁸

PHAST in Mozambique

In a peri-urban pilot project in Maputo, the following outcomes were achieved in only 5 months:

- 52 improved latrines completed at households that used traditional, unhygienic latrines
- 107 rubbish pits were dug and used properly during the pilot phase of the programme.

In Chimoyi, a similar pilot was conducted that led to 53 out of 55 participating households switching from a traditional, unhygienic latrine to an improved latrine, as well as the introduction of handwashing facilities and rubbish disposal pits.

These improvements were done without subsidies.

Source: Musabayane 1997: 9-11.

There are numerous methodologies that can be employed to support a participatory programme on the ground.⁹ The effective use of these "tools" is most often contingent upon the beliefs and attitudes of the external facilitators and the supportive governmental or donor institution.

But do participatory water supply and sanitation projects actually achieve the objectives of sustainable development? Many critics of participatory development processes argue that they are nice in theory, but impractical to apply. For instance, critics contend that they are time-consuming exercises and are not easily applied to large settlements or districts.

There is growing evidence around the world and in South Africa that these assumptions may not be wholly accurate. The Gwanda District Council (Southern

Zimbabwe) has successfully integrated PHAST into its overall operational approach to development in the district. A supportive environment has been created for field level officers (like Environmental Health Officers) to conduct PHAST exercises with communities. Results have included an increase in latrine coverage in the district (without subsidies in many cases), measurable improvements in hand washing, more responsive field level O&M, and sustained levels of cost recovery for water supply in many villages.

District level participatory work has increased dramatically throughout East Africa since the early 1990s (see NETWAS 1998a and 1998b; and IWSD 1994). PHAST is being tested in South Africa at a district level in Bushbuckridge (Northern Province), Mount Frere (Eastern Cape), and Leliefontein

⁸ Water AID (Uganda) and the RUWASA Project (Uganda) are but two examples of this approach (NETWAS 1998b).

⁹ Participatory methodologies have mushroomed around the world, as have the acronyms by which they are known. Some of the more common participatory methodologies used in the South African water supply and environmental sanitation sector are Participatory Hygienic And Sanitation Transformation (PHAST), Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal. For a discussion of the strengths and weaknesses of participatory programming see Breslin and Delius 1996.

(Namaqualand, Northern Cape). All of these initiatives suggest, at the very least, that participatory programmers are addressing the issue of "scale". These initiatives are also suggesting that the task of promoting participatory programming at a district level is not impossible.

Participatory programmes are also criticized because many believe that they take too much time to implement. Again, the validity of this criticism is being questioned. First, the South African water supply and sanitation sector has moved forward very quickly. Yet, despite the rapid speed of delivery, it is widely recognized that sustainability problems in the sector are significant and may have been caused, in part, by the rapid pace of delivery. Critics of the time taken to implement a more participatory programme must bear in mind the wastage caused by rapid delivery.

Common Problem Areas in Participatory Programmes

Some of the problem areas that are recognized by participatory practitioners:

- Strong facilitation skills are required, which are not always apparent
- Considerable training and follow-up support is often required. This is not often available (especially follow-up support)
- In the case of PHAST, locally-relevant artwork is required (which can be costly and difficult if artists are not available)
- The development sector still requires quantifiable outcomes. Participatory practitioners do not always meet this requirement, which leads some to question their work/results
- A proper institutional environment that allows participatory work to flourish is required, but is rarely in place (Taylor 1997)

Second, there is growing evidence to suggest that well managed and designed participatory programmes are not, in fact, as time consuming as critics suggests. Examples of this abound in South Africa where, for instance, village water quality improvements have been considerable in a short period of time (see Breslin 1999b).

In Kheis (Northern Cape), a sanitation project had stalled for over one year. The reason was that the community wanted flush toilets. The engineers explained that this was impossible given the climate and water scarcity in the area. The situation deadlocked. The project was restarted after one day of community-based participatory sessions where community members were no longer told what they could and could not have, but rather asked to explore, for themselves, the numerous sanitation options (including flush toilets) available to them. Through the process, they decided to move forward with a demonstration VIP, double vault VIP and urine diversion system (Breslin et. al. 1998).

The issue of time may, in the end, be overstated.

Participatory programming is not a panacea, and there are numerous gaps that must still be addressed if the full potential impact of participatory development is going to be achieved in the field (see box on page 9). Yet, while the weaknesses of top-down planning are well known, the South African water supply and sanitation sector is still more characterized by top-down planning than participatory programming. A fundamental change in policy, guidelines and

institutional approaches to development is required if the latter is to predominate in the field.

3.2 Financing Sustainable Water Supply and Environmental Sanitation

Sustainable water supply and environmental sanitation systems require finance to build, to operate and to replace. In South Africa, water supply and sanitation has been heavily subsidized in the areas of construction, operation and maintenance. These subsidies have provided potable water to millions and hygienic sanitation facilities to many, and have rightly been used to address the particular historical legacy of South Africa.

Unfortunately, the level of subsidization apparent over the first five years of independence in South Africa will not be replicated in the near future. Alternative financing models, which take into account new institutional roles and responsibilities as well as likely financial resources are therefore required.

Creative approaches to future water supply and sanitation financing will be required in order to ensure that the millions who still lack adequate water supply and sanitation will someday be serviced. Innovative targeting mechanisms will also be required in order to ensure that the poorest are not left behind because they cannot afford to pay for a particular level of service.

Some models that could be considered to meet these objectives are suggested in broad outline below, although these models are not exhaustive. Again, full subsidies for future capital costs may not be realized. Moreover, private sector financing for capital costs is a possibility but has not been implemented at a large scale in rural South Africa.

To fill the funding void, South Africa is experimenting with a range of loan-based financing schemes (see Venter-Hildebrand 1999). These initiatives are in their infancy, and efforts have been made to creatively move away from securing funds from large institutions (who are generally unwilling to risk lending to communities with seemingly negligible credit histories and poor infrastructure payment histories) to community-based lending schemes (like Village Banks). In KwaZulu/Natal, Operation Hunger successfully implemented a loan-based sanitation project that led to the construction of over 300 toilets, had a 100% repayment record at the conclusion of the project, and reduced the subsidy for sanitation from R700 (which was common practice at the time) to only R350 (see Breslin, Madrid and Mkhize 1997). Small-scale credit schemes of this nature

Innovative Targeting – India

In Kerala State, the Socio-Economic Unit (SEU) Programme developed standpost criteria that included local cross-subsidies. Each standpost serves between 15-40 households. Of the participating families, 5 must be households below the poverty line. The result is that poorer households can participate in the scheme, and do not pay, because wealthier households subsidize these poorer families through their payments.

Source: Kurup 1996: 18

may become more important in South Africa as financial resources for future capital costs are uncertain.

Another alternative used in some parts of the world is to develop "**percentage** of cost" subsidy schemes, rather than making the subsidy a fixed figure (like R600 for a toilet in South Africa). The advantages of this approach are considerable, as the incentive is to drive the cost of the system down so that the final amount paid (by a government or a donor) is as little as possible, without compromising on the quality of service.

In some parts of the world, subsidies have been used as a token incentive only. One of the best examples of this approach is in Zimbabwe, where

Innovative Subsidization – India

Since 1994, local governments in Kerala have contributed 15 percent towards the total cost of a sanitation facility, in the form of a subsidy. National government has provided a subsidy of 60 percent, and households make up the balance of 25 percent (20 percent cash and 5 percent unskilled labour).

In the process, the actual cost of a toilet is reduced (local materials are used, for instance) because all role players – from the state to the household – have an incentive to reduce costs. Local government, in particular, strives for high quality low cost systems because their revenue base is exceptionally small. Lower costs translate into lower subsidies from local government and lower cash contributions from the household.

Source: Kurup 1996

sanitation provision has been promoted through intensive national and local health education programmes, construction training for builders and a very small material subsidy (in the form of 1-3 bags of cement). The subsidy itself is important as an inducement to participate in the national or local initiative, but relatively small in terms of the cost of the facility. Importantly, Zimbabwe has had to eliminate this subsidy due to financial constraints, although some donors (like UNICEF – Australia) have funded the continuation of these subsidies at district level.

In other cases, no subsidies are used at all. Government and donor support is generally targeted at strengthening the capacity of local builders to construct hygienic toilets. These builders are then hired by families to construct toilets as required.

Governments and donors also invest a great deal of human and financial resources into health and hygiene education programmes and/or social marketing. The intention is to increasing consumer demand for sanitation from the perspective of improved health and/or social status and convenience (see Blackett 1994; and UNICEF 1998).

The importance of finding innovative ways to subsidize capital costs in South Africa is, again, important from social, historical, developmental and health perspectives. Given the current political climate, new models will undoubtedly have to be developed that emphasize greater contributions from local communities for capital contributions than has been the case in the past.

Perhaps the bigger challenge in South Africa relates to financing the O&M costs of existing projects. Many communities around the country have been dependent upon external O&M subsidies, and there is growing evidence to

suggest that local communities' capacity to replace these subsidies with community-generated revenue is limited (Breslin 1999a).

The water sector has placed considerable hope on the "Equitable Share" from local government. Local government, for its part, may be correct in saying that they should not be burdened with the huge financial implications of poorly designed and financially unviable water schemes. And even though the "Equitable Share" was largely designed to subsidize poor households for basic services, the reality is that local government has every right to spend their "Equitable Share" as they wish. The "Equitable Share" will not, at least in the short term, fill the void left by DWAF's removal of O&M subsidies for water projects.

Cross-Subsidies in Practice

Small villages in Sekhukhuneland (Northern Province, South Africa) have been practicing localized cross-subsidization for years. Women organize themselves around a water point (usually a hand pump). They pay for repairs and maintenance, and cover the costs of poorer participants who are part of their group but can not afford the water.

This self-selection around water points is quite different from current sector policy that places premiums on standpipe placement, instead of considering the social issues around water point use. Self-selection engenders trust among participants. Women decide for themselves how they want to cover the costs of poorer households, which is far less bureaucratic than the current system. And problems are most often addressed within the group, instead of by committees.

The harsh reality from around the world is that government or donor subsidies for on-going operation and maintenance have not been sustainable. Africa is littered with failed water projects that only operated because of exogenous aid. South Africa may experience similar problems as subsidies for diesel, operators' salaries and repairs are also eroded. Unless subsidies for O&M can be sustained over time (and the budgets and political will for this demonstrated), schemes should be designed that are not dependent upon external support.

This does not mean that some degree of subsidization is not possible for a defined period of time. Many schemes have been implemented where subsidies have been reduced incrementally over time.¹⁰ In Karonga (Malawi), for instance, subsidies and

technical support for village level O&M were systematically eroded over a period of 5 years. The intention was to build up the confidence and capacity of user groups and pump attendants over time (Noppen 1996).

Transparency, consistency, appropriate technology and effective spares networks (see below) seem to be critical to the effective implementation of schemes where subsidies are reduced over time. Mechanisms to ensure that

¹⁰ The erosion of these subsidies must be based on a reasonable time frame and payment policy. In Leliefontein, desalination plants were installed and residents expected to pay R12/month to "build up a culture of payment in these villages" according to a key role player in the project. After 2 years, the monthly tariff would jump to R98.50 according to the business plan. This clearly misses the point.

the poorest, who are most dependent on the external subsidies, are catered for after the withdrawal of such subsidies must also be considered.

Targeting also appears to be a critical factor in environments with scarce resources for subsidization. The challenge is to identify which families are unable to pay for services, and to find creative ways to ensure that their requirements are met. This challenge has not, to date, been given adequate attention in South Africa.

In India, socio-economic surveys are conducted to assess who is below the poverty line. These households often have to pay something for their service, but it is generally well below the actual cost required to sustain the scheme. Government grants cover the balance (Kurup 1996).

Payment for poorer households can, in some cases, be done locally as well. As in the case of Kerala (see above), many South African communities have learned that collecting money from each house may be unnecessary. Village water committees realize that it does not matter how much each house pays, but rather whether the money required to run a particular tap, or a set of taps, is collected. So, for instance, if it costs R70 to provide water to a particular communal tap (including O&M costs), it really does not matter whether every household pays R5, or some pay R10 and others nothing, or one house pays the full R70. For the committee, all that matters is that they need R70 from that tap. The result is that richer households in the community subsidize poorer households.

Another model being discussed during recent sector evaluations at project level relates to levels of service (Breslin 1999a). In areas where some households have yard connections, an alternative tariff structure is being proposed that caters for the poorest. Many community members (**including** those who would have a yard connection) believe that a significantly higher tariff can be charged to those with yard connections. The extra money collected can cross-subsidize those who cannot afford to pay for a yard connection. Households who do not have a yard connection can either rely on a communal standpipe, or as in the case of Emayelisweni (KwaZulu/Natal), can draw water from the private taps.

The issue of localized cross-subsidization requires considerable work at the start of the project however. If the rules for cross-subsidization are not clear at the start of a project, but developed on an ad hoc basis, the potential for future problems becomes real. Also, localized cross-subsidies will only work if the scheme is generally affordable for the community as a whole. If the cost of running the system is completely beyond the capacity of a community to pay, then local cross-subsidies will be ineffective.

3.3 Management for Sustainability

Water and environmental sanitation projects will only achieve their real and potential benefits if they are managed effectively. System problems – whether at tap or village level – must be addressed timeously and proactively in order to reduce the potential downtime of a system. Resources must be accessed rapidly, and spares must be readily available on site. The finances required to run a scheme (regardless of the source of payment) must be collected as required, and utilized for its intended purposes.

The “demand responsive approach” to water supply and environmental sanitation argues that management of a system should be at the lowest possible level. But what is this level in practice?

Obviously a great deal depends on the level of service chosen. Bulk schemes require different management systems than stand-alone borehole schemes, at least at one level. But, at another level, there are important areas where roles and responsibilities are similar regardless of the type of scheme under consideration. It is to these overlapping roles and responsibilities that we now turn.

The lowest possible level for O&M and cost recovery is the water collection point itself, regardless of whether the collection point is communally managed or within a yard. The main reason why emphasis is placed at this level of management relates to issues of urgency. A broken tap or burst pipe at standpipe level has considerable consequences for household “water managers” (most often women, but also children). They will respond to problems at tap level, if possible, far quicker than a distance “repair team” (even village-based) which may or may not be available when required.

The “Village Level Operation and Maintenance” (VLOM) concept was largely developed in response to the consistent international problem of poor O&M support from centralized structures. Technologies were originally developed that could be maintained and repaired at local level with limited external support. As a result, water supply could be controlled and sustained by local communities. Over time, greater emphasis has been placed on the “software” side of VLOM. And while the VLOM movement was originally focused on handpump design and implementation, it has now grown into a concept that applies across technologies.

More and more research suggests that effective water collection point maintenance systems leads to rapid responses to localized problems; less downtime due to simple repairs; a greater sense of ownership of water collection points; better water point hygiene; and in many cases lower tariffs for

Decentralised O&M in Practice

In Tjakastad (Mpumalanga, South Africa), “block committees” were formed to address problems of O&M and to manage the extension of the water supply network (to household taps). The block committees were responsible for water point hygiene and to replace broken taps as required. Block committee members were mostly women, and reacted timeously to tap level problems.

households as the cost for localized O&M is not included in the overall water tariff.¹¹

Problems will undoubtedly emerge that are beyond the capacity of this water collection point O&M system. As a result, a support tier, usually at community level, is often included in decentralized O&M systems. This village-based O&M tier is itself supported by a higher support network that works across multiple villages. Clearly defined roles and responsibilities between all three tiers is critical, as are the required spares and institutional framework for the effective management of this system.

But what would this system look like in practice? Recent evaluations of Mvula Trust and DWAF projects suggest that communities have, out of necessity, developed multi-tiered systems that are consistent with international models (Breslin 1999a).

Such a system would include a range of responsibilities for people at tap level (or, as in the case of Tjakastad discussed in the box above, O&M committees responsible for multiple taps within a relatively small area). Participants in these evaluations consistently argue that tap level O&M should include responsibilities like:

Why should only one person be responsible for diesel?

In Umtebe (Eastern Cape, South Africa), the water committee has found a creative way to decentralize responsibility for the purchase of diesel. A rotating system is in place, where 2 households are responsible for the purchase of diesel. Once diesel is purchased, responsibility shifts to another 2 households. All households participate in this scheme. The system appears to work well, as significant peer pressure will immediately be brought to bear on defaulters.

This strategy is commonly practiced around the world, especially in countries like India. The idea has not been considered more broadly in South Africa because sector practitioners have argued that such a strategy "could never work in this country".

- Replacing broken taps
- Fixing blocked soakaways
- Repairing eroding tap location or pedestal
- Ensuring tap area is clean
- Locking taps or managing the collection of water at collection points

Participants most often argue that payment for materials (like taps) or completed work (by the "Tap Co-ordinator") should come from households utilising the tap(s). This ensures both rapid responses, payment upon completion of work, and accountability to the customers.

At a broader, community-based level, another tier is discussed. This tier would be responsible to the block/tap O&M structures, but would be primarily responsible for:

- Operating the engine
- Basic maintenance of the engine
- Repairing the engine as required
- Repairing broken pipes
- Cleaning reservoir(s)
- Maintain the reservoir(s)

¹¹ See, for instance, Davis and Brikké 1995; Bastemeyer and Teun Visscher 1990; Roark *et. al.* 1993; Arlosoroff *et. al.* 1987; Noppen 1996; and WASH 1993.

Training at community level would also focus on strengthening the capacity of community level O&M operators to identify and respond to emergent problems, even if these problem were beyond the capacity of the community to address.

Community level responses to emerging O&M problems can, at times, be delayed because water is still flowing. This is understandable, because access to alternative supplies of clean water can be limited.

Better preventative maintenance may nevertheless occur if roles and responsibilities are shared at village level, as suggested during these evaluations. O&M should not be the responsibility of one person, or a handful of people, but rather the responsibility of all participating households. By broadening responsibility, one may find that the pressure to keep the system running (even when it should be repaired) will diminish, preventative maintenance at tap level improves, repairs occur timeously, and the operating cost to the household declines. "Ownership" of the system is consequently deepened.

The evaluations of South African sector work did not have a great deal to say about the multi-village support structure required to assist community-based O&M schemes. This is again understandable, as previous homeland models were not necessarily responsive to local requirements and O&M was not decentralized as envisioned by participants in the evaluation.

Despite this limitation, a number of insights can be gleaned from the decentralized O&M systems

described above. First, it is clear that many participants believe that O&M responsibility should be shared. As a result of this, the designed support structure should compliment, not stifle these community-based objectives.

Second, evaluation participants consistently claim that O&M should be responsive and accountable to their needs. In some villages, people felt that the O&M operator should be replaced because he did not respond to their demands timeously, or because he did not complete his job to their satisfaction.

This principle would need to be applied to the multi-village support structure under consideration. The danger is that a structure is set up that is only accountable to the Water Service Authority in the area. This would, over time, erode the confidence of community-based O&M systems, and could lead to despondency and frustration at local/tap level. Accountability must be to both the WSA and the local communities this support structure services.

Decentralized Tap Management in Practice

In Hlanganisa (KwaZulu/Natal, South Africa), "Tap Co-ordinators" have been chosen for each tap. The households who utilize a tap chose someone for this position that they trust. The majority of "Tap Co-ordinators" are women. The "Tap Co-ordinators" collect money each month from households and pay the water committee. Each tap is expected to raise a certain amount of money each month. The WC is not concerned about who actually pays, but rather whether the total amount required to run the tap has been collected.

Finally, many people suggested that the potential for job creation through O&M had not been realized. Pensioners have a reliable source of income. Why, it is often asked, are long-term jobs not targeted at poorer community members who need the income?

Again, this argument could be extended to the development of O&M support systems. Multi-village O&M support services should, as much as possible, be linked to the issue of local economic development. CBOs, SMMEs, and local NGOs could be mentored into this role over time, or responsibility for this function could be housed in local government. Local jobs can be created, and income can remain in local areas instead of being channeled to corporate headquarters in larger towns or cities. The spin-offs for longer-term local development could be significant.

Multiple Systems in One Village

In Mahlala (Mpumalanga, South Africa), multiple tap level systems have developed due to the collapse of centralized O&M and cost recovery systems in the village. Some households have banded together and elected one person to manage their water collection point (O&M, cost recovery and, in practice, cross-subsidies between households). Others have formed small groups where all household members are responsible for water management and hygiene. Individuals make payment to the collection office rather than as a group.

The system appears to be accepted at local level, and has led to better water point management and payment. Importantly, outsiders could never have designed this system unless they facilitated its development with the outcome of a trusted, well managed tap level system as the project goal.

Creative strategies to support the decentralized O&M systems being proposed on the ground are required. And the potential benefits of such an approach could be considerable. One may discover more responsive and effective O&M, lower O&M costs which would subsequently reduce tariffs and free up scarce household funds for other uses, increase the job creation potential in an area, and enhanced ownership of the existing schemes by consumers.

As suggested above, similar considerations could also be applied to cost recovery. "Tap Co-ordinators" have, in many cases in South Africa, assumed responsibility for collecting revenue from households who utilize one water collection point. The money collected is transferred to a village water committee, who in turn could transfer the funds to local government or a water service provider. The system can, if developed effectively by local residents, address problems of trust and communication that constantly

undermine projects throughout the world.¹²

The key challenge facing sector role players is to find ways to decrease the cost of water supply to households while ensuring that the systems

¹² As Noppen (1996: 23) argues, the issue of trust at local level is not always apparent. In many cases, neighbours do not trust each other, and the amounts of money collected are so small that they are kept for long periods of time until they accumulate to a level that is worth banking. This basket of money can, in some circumstances, be a temptation to whoever is managing the account. Addressing systems that deal with local fears of theft are critical to project viability.

employed are trusted, well maintained and responsive to local needs. Systems that are locally designed and based on existing management systems have a greater chance of success than those which impose systems from the outside. As Morgan (1997: 2) argues, "perhaps the time has come to reinforce a trend which, clearly, is being talked about far more: studying what local villagers do of their own accord and helping communities to upgrade these efforts".

This may mean, in the end, O&M and cost recovery systems that are far less bureaucratic and formalized than has been the case in recently completed sector work.

Before proceeding, a few comments on the potential role of the private sector are required. South Africa is rapidly making agreements with large, multi-national water service providers who will be responsible for O&M and cost recovery. The private sector, it is argued, will efficiently ensure that systems are operating and people are paying. The lure of this is unmistakable - cash strapped districts councils are being enticed by the private sector with promises of reliable revenue from communities currently not paying for services.

Unfortunately, little discussion on the potentially higher costs associated with private sector involvement in cost recovery and O&M is being entertained. Consumers will obviously have to pay for comparatively high private sector overheads.¹³ They will also have to pay for the costs associated with long distances from towns to villages (often over poor or impassable roads) to collect funds or provide O&M support. Profits will have to be worthwhile for the private sector to stay involved, again pushing up the cost of this service to poor households. And communication difficulties may lead to long delays between O&M problem identification by users and the resolution of these problems. The limited or non-existent experience many of these private sector interests actually have in rural O&M and cost recovery should also be discussed.

Concerns are growing internationally about the actual impact and effectiveness of these multi-national water service providers. Evidence suggests that their services are consistently poor and costs can be very high to the consumer. In Argentina, a 30-year concession that was signed in 1995 has already been cancelled because water tariffs doubled and water quality deteriorated (*Latin Trade Business and Industry*, 1 March 1999).

The Water Supply and Sanitation Collaborative Council highlighted three studies that raise further questions about multinational water service providers. One study of privatization in low-income countries found that "private intervention is not bound to guarantee instant solutions to water supply problems in poor urban environments". The Abidjan City Council paid an international firm US\$17.8 million per year to collect garbage. The company has, to date, managed to collect only one-quarter of the amount generated in the city each day. And in Goa State (India), a contract was recently cancelled after the private

¹³ A recent ILO study on the privatization of public utilities, water gas and electricity, found that large corporate private sector involvement in Europe and Latin America did not lead to reduced costs for consumers as envisioned (see de Luca 1999).

firms promises of providing 24-hour continuous water supply all over Goa within 7 years proved to be fantasy (*Source Bulletin* December 1998).

Multi-national firms are well positioned in South Africa, and are in the process of securing long-term agreements with a number of District Councils and Municipalities throughout the country. And while these agreements may be valuable in terms of foreign investment, South Africa may regret these deals as the potentially limited capacity of these firms are exposed.

Private sector involvement that is consistently modeled around the world are, in most cases, small, localized entrepreneurs who concentrate on spares networks, and support services to villages in matters beyond the capacity of the village O&M system.¹⁴ These models of "private sector involvement" are rare in South Africa at present.

3.4 Sustainability and Health

Water supply and environmental sanitation are, in the end, health interventions. If this issue is not taken seriously then the developmental role of the sector must be questioned. The health and hygiene education components of South African projects – and many others – are uninspired and ineffective. The idea that a "community" will address health-related problems at the village level after a bland lecture on handwashing or malaria from someone involved in health is misguided.

International experience suggests that water supply and sanitation interventions, by themselves, will not bring about significant health improvements to communities and households. Water supply and sanitation are therefore seen as an important component of improved health, but a broader range of interventions is required in order to bring about meaningful health benefits.

Hygiene education is generally recognized as the critical gap between water supply and sanitation on the one side and improved health on the other.¹⁵

One of the main health and hygiene challenges is to reduce the gap between health-related knowledge, attitudes and practice. Experience

Community Action for Improved Water Quality

In Tweerivier (Namaqualand, South Africa), residents analyzed their water quality and found that water from both the taps and in water storage containers was contaminated. The community analyzed the problems of water contamination using PHAST. They initiated a clean-up exercise without external support. They cleaned the reservoir, pipeline, taps and water storage vessels. Follow-up tests showed that water was clean at both community and household level. Residents now monitor water quality regularly, and have sustained water quality at village level for over 12 months now (see Breslin 1999d).

¹⁴ See, for instance, Davis and Brikké 1995; Bastemeyer and Teun Visscher 1990; Roark *et. al.* 1993; Noppen 1996; and WASH 1993.

¹⁵ **Hygiene** can be defined as "the practice of keeping oneself and one's surroundings clean, especially in order to prevent illness or the spread of disease" (Boot and Cairncross 1993: 6).

suggests that this gap can be quite large. For instance, most South Africans are aware of the importance of handwashing after defecation but many do not actually put this knowledge into practice (or do so incorrectly).¹⁶

Another challenge is to reduce or eliminate the likely transmission routes of water-borne, water-washed and vector-borne diseases.¹⁷ By studying local health and hygiene behaviours and practices, we learn about how diseases are spread in a particular community and/or household, and what appropriate responses are required to address the identified problem.

Children Take Charge

A child-to-child programme in Kwa-Jobe (KwaZulu/Natal, South Africa) led to significant changes at a secondary school. Children developed a programme that:

- Increased the incidence of handwashing at school after defecation and prior to eating
- Raised funds to drill a borehole so that the school could have access to water for drinking and handwashing purposes
- Developed plans to build school toilets so that the students would learn practical construction skills and increase their understanding of how a VIP worked.

The project demonstrated that children can be active health promoters and implementers, rather than passive recipients of health messages.

Source: Breslin, Madrid and Mkhize 1998.

Importantly, emphasis should be placed on addressing behavioural issues rather than on particular diseases (like diarrhoea), as a **combination of hygiene behaviours** may be required to reduce one disease, while **one hygiene behaviour** may help reduce the transmission of multiple diseases.

While the importance of health and hygiene promotion in maximizing the impact of water supply and sanitation interventions is well known, these initiatives are also commonly recognized as the most difficult programmes to plan, implement and monitor.

Most health/hygiene education programmes are targeted at adults, formal health care sector personnel

or school children and emphasize the one-way communication of pre-fabricated hygiene information and practices. Mothers, fathers, care-givers, teachers, doctors and community health workers are responsible for transferring the acquired health/hygiene knowledge and modifying inappropriate practices at the household, school and community level.

Children, informal health care providers like midwives and traditional healers, political and religious leadership structures, and informal sector organizations like stokvels are often neglected when considering health and hygiene promotional programmes.

Moreover, the tendency to "bombard" communities with a vast array of messages, largely designed outside of the village and rarely adapted to local

¹⁶ It should be noted that this is not peculiar to South Africa. In the United States, a study was conducted on handwashing practices. A video recorder placed in a public bathroom (male) revealed that those observed only washed their hands when there were other people in the bathroom (due, most likely, to peer pressure). When alone, people left the bathroom without washing their hands (implying that handwashing is often not seen as **critical** to good health).

¹⁷ **Vectors** are any "insect, tick, mite or rodent which transmits (carries) an infection from one animal or human host to another" (Thomson 1995: 9).

conditions, often leads to confusion and dismay on the part of community members and practitioners.

A more comprehensive approach to health and hygiene education and promotion could include at least three components.

One component of the initiative should be concerned with educating the local community on why water supply and sanitation are important from a health perspective. Particular emphasis should be placed on how proper sanitation facilities, increased quality and quantities of water and appropriate hygiene behaviours and practices can lead to a reduction in locally-specific diseases.

The second component of a health and hygiene initiative should concentrate on the proper **maintenance and use** of both water supply and sanitation facilities. Particular emphasis could be placed on issues such as:

- keeping toilets clean;
- ensuring that the toilet is properly ventilated;
- check fly screen at least every six months and replace when the screen no longer prevents flies from escaping from the toilet/vent pipe;
- fill in cracks that appear on the walls, floor, door and roof;
- pouring water down the vent pipe every month to eliminate spider webs;
- avoiding the disposal of waste water in the toilet;
- avoiding placing rubbish, cigarettes, disinfectants and other foreign matter into the toilet as this will reduce the life of the toilet;
- ensuring that water systems are properly maintained and operated;
- ensuring that there is a reduction in the time required to collect water;
- reducing the amount of "down time" of a water system (weeks/year or days/month);
- ensuring that the availability and type of in-home water storage containers are well maintained and clean;
- calculating the percentage of households using clean water sources for drinking and cooking water; and
- monitoring **who** is actually using the new systems. For instance, are toilets only used by adults or do children also use toilets? Who collects water, and what are the positive and negative consequences of this (negative consequences for children could include reductions in amount of time at school/studying and the physical strain associated with the collection of water).

Safe Disposal of Child Stools and Handwashing – Burkina Faso

Rather than focusing on the plethora of behaviours that undermine household health, a project in Burkina Faso focused only on the safe disposal of child stools followed by handwashing.

37 women tested the new behaviours and found that they contributed to improved health.

To spread the programme, positive messages were developed (rather than health messages). The messages were focused on issues of "social desirability and the reduction of nuisance that the new practices could bring".

The programme, in the end, had a considerable impact in the community.

Source: Curtis et. al. 1997.

It can be assumed that a water supply and sanitation programme is having a health impact ***if it can be shown that the new facilities are well maintained and used properly*** by all members of a family and community. Health problems are encountered when water systems are down for a long period of time (forcing people to collect water from contaminated sources), when toilets are not kept clean or when children's faeces are not disposed of properly.

The third component of a health and hygiene initiative should be to concentrate on the changing of ***at least*** one behaviour that contributes to poor health in the community. Examples of initiatives that are specific to sanitation could include safe and effective:

- hand-washing after using a toilet and before eating; and
- disposal of infant and child faeces.

What often intimidates sector role players is the perceived enormity of the health and hygiene task. The list above, which is partial, could overwhelm many institutions. Importantly, they also overwhelm communities. An important point to re-emphasize is the need to target ***one*** locally specific behaviour that could be modified for better health as part of a water supply or sanitation programme. This is usually the start of a broader health programme. Further promotional messages and campaigns are easier to implement in the future once communities see that the first changes in behaviour had an actual impact on health.

Additionally, international experience suggests that participatory programmes, where local residents identify a health problem to be addressed or behaviour to be modified, have a far greater chance of success than pre-fabricated, generalized messages designed by project agents and introduced on the belief that 1.) the practices promoted are not being done in the village (usually due to ignorance) and/or 2.) that if people ***know*** something then they will obviously practice it (usually structural and social constraints shape practice).

3.5 Income Generation and Poverty Reduction

The South African water supply and environmental sanitation sectors have focused on providing water supply for domestic consumption and short-term jobs for community members during the construction of a project. Longer-term jobs may be available for a handful of people (usually male pensioners who are given the responsibility for village level O&M or builders who can use their construction skills in the immediate vicinity). The full potential of job creation has not, to date, been realized, as this has been a secondary priority of the sector.

Income generation and job creation has become critical components of many water projects around the world. Productive water points, where

households earn an income from the use of water for productive purposes, are proving to enhance the prospects of project sustainability.

The most obvious additional use of a water source is for agricultural purposes. Water supplies are designed to not only meet household consumption needs, but are also linked to private, community or collective gardens. Food produced at these gardens can be used for household consumption (thus potentially freeing up scarce financial resources for other purposes) and for sale. As Lovell *et. al.* (1999: 5) argue, linking water points with agricultural production can "play an important role in household income and livelihood strategies, and, through diversification, enable people to become less reliant on single production activities such as rainfed agriculture". Other productive uses for water can include construction/brick making, aquaculture, animal husbandry, and small-scale businesses (like washing clothes).

Other examples of creative water sector initiatives for income generation abound. In India, small groups of poor community members have been formed around water points. The water points are linked to forestry as an income-generating venture (see Chamber *et. al.* 1989). Women's irrigation groups in Bangladesh have, under the right conditions, led to considerable improvements in women's income and social status within the community (van Koppen and Mahmud 1996). And in another programme in Bangladesh, groups of landless labourers have invested in irrigation equipment that allows them to provide irrigation services to farmers and in the process raise their incomes (Wood and Palmer-Jones 1991).

Creative ways in which to promote local development through job creation could also be better explored by the South African water supply and environmental sanitation sector. For instance, decentralized management of both cost recovery and O&M could mean small but potentially reliable incomes for a wider range of community members than are currently apparent. Opportunities for some entrepreneurs to develop their businesses into a multi-village O&M support service could be explored. And jobs created during construction could be better targeted to those households who are considered

Innovative Targeting in South Africa

Operation Hunger implemented a series of projects in Klipfontein (Namaqualand, South Africa) that attempted to reduce growth faltering in this impoverished village. Households with children whose growth had faltered gained priority access to jobs created through development projects in the village (agriculture, "project hotel", animal husbandry and land management, sanitation, and rainwater harvesting). Women from these households had first priority, followed by men from these households, and lastly community members whose children did not demonstrate signs of growth faltering.

The results were impressive from a nutritional point of view. Over 70 percent of the families who gained access to jobs (combined with nutritional education) saw their children grow the following months and sustain their growth for a further 6 months.

Local residents designed the strategy, and friction over job selection was nominal.

the poorest in the village. This is obviously a difficult issue to address given unemployment in rural South Africa, but there are examples of creative targeting mechanisms that do ease this potential tension point in a village (see the box on the previous page).

Creating jobs and generating income possibilities is not easy, and cannot be done as an afterthought. Targeting jobs to those most in need also requires considerable work. Importantly, income generating possibilities stemming from

Constraints on Vegetable Gardening

As Batchelor (1999: 3) argues, "the main technical constraints on successful vegetable production are the availability of (or access to) land, water, agronomic inputs, extension advice, and fencing material. There are also a whole range of social, economic, legislative and institutional factors that can have an important bearing on the success of small-scale vegetable production. These include the availability of labour, organizational skills, availability and proximity of markets, availability of credit, water rights, land tenure, and a range of gender issues".

improved water supply should be looked at with a critical eye. Markets for produce or bricks (for instance) could become easily saturated in some case, and thus undermine the programme. Also, practitioners must realize that jobs will only be created for a few. A "community garden" rarely helps a community but often helps 10-30 families within that community.

Finally, water supply schemes that are linked with income generating projects have design implications, as more water is required to meet both consumption and productive purposes.

This could raise the price of water for households **not** using improved water supplies for income generating purposes. Tariffs have to be set to ensure that those who use the system for productive purposes are charged accordingly. These issues should be adequately addressed during project planning, and not after the system becomes operational.

Despite these concerns, income-generating strategies that are well planned and targeted can augment the impact of water supply and sanitation projects. Sustainability becomes more possible as reliable water supply becomes critical for both household consumption and local production, and ownership of the scheme deepens. Water supply and sanitation can, in the end, fit into broader development strategies in the village, which again increases the likelihood that these schemes will be operational over time.

4. Outcomes-Based Programming and Sustainability

South Africa's water supply and environmental sanitation sectors have spent considerable time and finances developing guidelines for sector role players. The guidelines are comprehensive and include groundwater protocols, water quality standards, technical issues, finances and community-based training. The guidelines have, in the end, served as a road map for practitioners involved in community-based water supply and sanitation.

Like most guidelines around the world, South Africa's guidelines are meant to "guide" rather than direct. Unfortunately, the reality is that these

guidelines have been applied very strictly in the field. Bureaucrats rarely allow practitioners to move outside the guidelines. The best example of this has been the extremely strict interpretation of VIPs as the minimum standard sanitation option in the country.¹⁸ Water supply projects look almost exactly the same throughout the country (including technology and management frameworks). And despite the intention of “tailor-made” training courses for community training programmes, the reality is that training courses are most often prefabricated models that adhere to sector guidelines on what should be done.

But perhaps the biggest problem with the guidelines within the sector is that they do not promote outcomes-based programming. This matter is further reinforced by the payment system evident in the sector. Practitioners are paid for completing a task – like running a training course, forming a committee or submitting technical designs for a scheme – rather than on issues of quality and sustainability.

The fact that a training course has occurred tells us nothing about whether that training course was effective, or whether the trainees will be able to apply these new skills effectively in practice. Technical designs do not tell us whether the system is affordable or operational at local level, and can be sustained over time.

Recent sector evaluations suggest that the guidelines of the sector should be reconsidered, and that the current M&E systems in place significantly revised. This section proposes some ways in which this could be done. And while not comprehensive, it is hoped that this section will provide some concrete outcomes-based suggestions that can be further developed in the future, and built into Mvula’s new model for community-based water supply and environmental sanitation.

4.1 Rethinking Feasibility Studies

Feasibility studies for projects have been poor (and perhaps meaningless), although this is understandable given the real purpose of a feasibility study in South Africa to date – to get a project started. Future feasibility studies should possibly explore the following issues (although this list is not exhaustive):

- Current water sources used by residents and the management systems in place that are keeping these systems operational (how can these systems be utilized in an improved scheme)
- Failed water supply projects (why they failed, what people learned from that experience, what would they do differently now)
- Existing sanitation systems (who builds, where are materials purchased, why do people have toilets, what do they like about them, what would they want to improve – if anything)

¹⁸ This interpretation of the guidelines is now changing, primarily because the future of the sanitation subsidy is so uncertain.

- History of development projects in the village (are there any existing committees in place, have there been positive experiences that can be built upon, what negative experiences occurred and what should be avoided)
- A proper skills audit
- A health audit (see below)
- History of conflict in the village
- Local communication channels that have been utilized in the past (including radio, churches, mass meetings, school, billboards, posters)
- Possible water supply and sanitation technical options that could be considered in this village, suggested cost implications of each choice, and management requirements of each option (note: not who should be responsible for management or how it should be managed, but rather what would have to be done to ensure the system function)
- Economic assessment of the village (could be quantitative, qualitative, or both)
- Institutional assessment of the community (including the broader institutional framework within which this community exists)

The feasibility study could easily be completed using the participatory methodologies described above. If facilitated properly, it could generate considerable momentum for the proposed project. The relevant Implementing Agent would make payment for the facilitation of this feasibility study upon the study's submission and acceptance. Importantly, practitioners would have an incentive to explore these issues in detail. If parts of the feasibility study are left out, or if only a few people are consulted, then problems could emerge as the project is implemented that will not only undermine the project but also stall future payments.

4.2 Reconsidering Planning

Once the feasibility study has been accepted, practitioners should be able to engage the communities and the District Councils in a participatory planning process for sustainable water supply and sanitation. It is recognized that these recommendations are, to some extent, being overtaken by the Area Planning and Water Service Development Planning processes. Despite this, these recommendations are offered because these two processes are fraught with problems and will, in the end, fail to achieve sustainable water supply and sanitation management and programming at District level.

A proper planning process would include at least the following:

- **Technical options** – explore, with local community members, the range of options that are available to them, and make decisions based on what is practical for now. Develop a strategy to upgrade over time, and ensure that there are adequate back-up systems in place to protect communities from project failure. The technical options discussed must include cost implications for households. Develop a plan for sanitation as well that, again,

includes what can be done now to improve existing sanitation facilities now, with a plan to upgrade over time.

- **Management Options** – ask communities how they want to manage their water supply system, and explore how this could compliment the strategies of the District Council. Explore different local options, based on how water systems have been managed in the past within this village. Clarify roles and responsibilities based on what can be done at local level and what support (technical staff and spares) would be required from outside the community. These deliberations would have to explore payment options and O&M systems. The cost implications of the proposed systems on household tariffs have to be clarified and agreed upon. Plans to cater for the poorest (either through local cross-subsidies or government grants) must be included. Targets for sustainable management would have to be set (like expected down time for repairs on the scheme over time, efficiency of collection).
- **Job Creation Possibilities** – plans would have to include plans for job creation and income generation (both short- and long-term). Criteria for who would benefit from these jobs and income generating possibilities would have to be established with local residents and included in the plan. Expected results would have to also be included (like increases in incomes for target group).
- **Health** – a health audit of the village, with particular reference to water- and sanitation –related diseases undermining health at household and community level should be submitted as a report. The healthy audit would also identify a health-related behaviour to be targeted for change based on the findings of the health audit. Baseline survey of this behaviour is conducted, and suggestions on the expected percentage increase in modified behaviour proposed. This would include a long-term time frame to achieve this objective.
- **Financial Implications and Time Frame for Implementation** – the plan would have to include a budget and a time frame for implementation that was based, as to be discussed below, on measurable outcomes.

The plan can be submitted, but its acceptance would be based on point 4.3 below.

4.3 Demonstrating Acceptance of Choices

The key to the acceptability of the plan is not necessarily someone, like a District Council or a committee member, signing a form. Instead, acceptability can only be measured adequately if consumers demonstrate acceptability. In an environment of declining resources, demonstration of support is particularly important. Suggestions on how this could be done include:

- **Modifying the Emergency Fund** – the Emergency Fund is a good principle that should be maintained, but it could be modified to demonstrate, more concretely, consumer acceptance of the plan. Instead of a lump sum

payment. households would have to contribute as they would when the project was complete. So, if a monthly tariff is R20 per month, then those households who have to pay must demonstrate this over a period of time until the "Emergency Fund" target is reached. If state support for poor families is part of the plan, then that funding must be allocated as well.

- **Collection of Funds** – the proposed system to collect these funds can also be tested during this period. Those who will be responsible for collecting funds will do so. Problems that emerge can be addressed in the formal training that occurs later in the project cycle. Reporting on the collection of funds can also be tested during this period. It should be noted that this approach would, by design, favour those who use local ideas and capacity rather than proposing new systems.
- **Testing Awareness** – a simple survey can be administered to test whether community members are aware of the programme. The surveys could include questions on the proposed health programme (behaviour chosen), the criteria for job creation, why people are paying and for what.

The programme will only proceed once targets are met. If the targets are not met it suggests that the proposed plan is unworkable or problematic, and the plan as a whole would have to be reconsidered. Again, this process will force practitioners to develop plans with all stakeholders (including women with children under 6 years), and to propose workable systems that build on local capacity. Incentives can be structured to ensure that success is rewarded.

4.4 Implementation and Training for Sustainability

The financial details of how this would work are beyond the scope of this paper, but do require considerable work. Moreover, consideration of technical issues based on outcomes-based principles is beyond the capacity of the authors. This section focuses on the social side only.

Outcomes-based issues related to management, health, sanitation, and job creation. To do this, payment for work completed would be done on the following principles:

- **Management** – in terms of O&M, each system would have to include an O&M plan for tap level work, community level work and multi-village support systems (regardless of who actually is responsible for these jobs). Realistic targets would have to be developed during the implementation stage of a project to test whether the proposed system will work. Payment is made on the achievement of these objectives. In terms of cost recovery, gaps would have been identified during the "demonstration phase" (section 4.3 above). Targets again would have been set, and payment made on the achievement of these objectives.
- **Health** – targets for changed behaviour would have been set. Payment would be made when these targets are met. To illustrate, handwashing could be targeted. The project would be deemed on track if there was a 20 percent

increase in handwashing within 6 months, increasing a further 25 percent in another 6 months.

- **Sanitation** – Payment would be made when it could be demonstrated that incremental improvements to existing facilities were made (like cleaner toilets, structural improvements, and better child faeces management). If builders are trained, then payment can be made on the completion of high quality demonstration toilets and the application of these skills at household level beyond the demonstrations.
- **Job Creation** – payment can be made when demonstrated income improvements occur, application of targeting principles agreed upon in the plan demonstrated, and possibly additional spin-offs can be measured (like better child growth in households targeted for support).

4.5 Post-Project Assessments for Sustainability

The Mvula Trust has developed a series of checklists that can suggest whether a project is viable. These could be employed during the post-project phase to assess whether the originally proposed plan worked. The checklists evaluate:

- **Levels of cost recovery** – are the funds collected adequate to sustain the project?
- **O&M** - is the system being maintained as it should, and is down time limited?
- **Communication** – does the communication systems in place engender trust for the project?
- **Health Impact** – is the project achieving its health objectives? Are taps operational and hygienic?

If these are in place then the project is likely to be sustainable. If there are problems in any given area then the project will encounter problems. Incentives can be structured so that the project agent could be rewarded for achieving success at project site.

5. Conclusion

The success of an outcomes-based programme is contingent upon effective M&E. The sector's almost total lack of M&E has proven, to date, to be crippling. Many of the problems identified in sector evaluations would have been addressed as they emerged if an effective, outcomes oriented M&E system was in place. The fact that so many of the identified problems have festered over time will only complicate efforts to redress the sustainability issues identified during the "revisiting Schemes" initiative. Fixing these problems will be costly and time consuming.

Effective, outcome-oriented M&E systems are a far cry from the M&E systems currently in use in the sector. Most current systems place an emphasis on monitoring cash flows and events (like did a training happen, or was a time-bound milestone met?). This actually tells the sector very little about the

likelihood that the money spent will contribute to a sustainable project. The sector needs to know whether the health education component of the programme was effective, whether "tap committees" can actually fix a tap, or whether the "block committee" is actually collecting enough money to pay for the costs of a water collection point. *If not, proactive actions must be taken to address the problem.*

The shift from current practice to outcomes-oriented, open-ended development will be complicated. Some suggestion on how to do this are offered above, but these require considerable work as well before such recommendations can become policy. This transformation may however be required in order to ensure that water supply and sanitation are effectively implemented in a future of scarce resources and changing institutional roles and responsibilities.

REFERENCES

- Arlosoroff, S; G. Tschannerl; D. Grey; W. Journey; A. Karp; O. Langenegger; and R. Roche. 1987. *Community water supply: the handpump option*. World Bank: Washington, D.C.
- Bastemeyer, T., and Teun Visscher, J. 1990. *Maintenance systems for rural water supplies*. IRC: The Netherlands.
- Batchelor, C. 1999. "Growing in importance – vegetable gardening in the south". *Waterlines* 17, 2, pp. 2-4.
- Berger, S.E.; and S. Esrey. 1995. "Water and sanitation: health and nutrition benefits to children", in Pinstrup-Andersen et. al., *Child Growth and Nutrition in Developing Countries*. Cornell University Press: Ithaca, NY.
- Blackett, I.C. 1994. *Low-cost urban sanitation in Lesotho*. Water and Sanitation Discussion Paper No. 10. UNDP-World Bank Water and Sanitation Programme: Washington.
- Boot, M.T.; and S. Cairncross. 1993. *Actions speak: the study of hygiene behaviour in water and sanitation projects*. IRC and London School of Hygiene and Tropical Medicine: The Hague and London.
- Breslin, E.D. 1999a. "Lessons from the field: rethinking community management for sustainability". Paper presented at the Rural and Peri-Urban Water Supply and Sanitation in South Africa – Appropriate Practice Conference, 14-17 March 1999, East London, South Africa.
- Breslin, E.D. 1999b. "Protecting drinking water: water quality testing and PHAST in South Africa". Forthcoming, World Health Organization.
- Breslin, E.D. 1998a. "Family dynamics – assessing the impact of changes in household contributions to village water supply". Unpublished.
- Breslin, E.D. 1998b. "There's a hole in South Africa's water bucket". *Reconstruct*, p. 4.
- Breslin, E.D. 1998c. "Nutrition and the water supply and environmental sanitation sector: making the links in theory and practice". Paper presented at the South African Nutrition Congress 1998, 26-28 May 1998, Sun City, South Africa.
- Breslin, E.D.; C. Madrid; and A. Mkhize. 1998. "Child-to-child: special schooling in KwaZulu-Natal". *Waterlines*, 17, 1, pp. 12-13.
- Breslin, E.D.; B. Netshiswinzhe; and R. Holden. 1998. "Lessons from the field: Kheis, Namaqualand sanitation". Unpublished.

Breslin, E.D.; C. Madrid; and A. Mkhize. 1997. "Contributions to Sanitation in KwaZulu/Natal". Paper presented at 23rd WEDC Conference, 1-5 September 1997, Durban, South Africa.

Breslin, E.D.; and P. Mutshinya. 1997. "Initial impact assessment: Seokodibeng sanitation project". Unpublished.

Breslin, E.D.; and P. Delius. 1996. "Participatory methodologies: strengths, weaknesses and ways forward". Unpublished.

Chambers, R.; N.C. Saxena; and T. Shah. 1989. *To the hands of the poor: water and trees*. IT Publications: London, UK.

Curtis, V.; B. Kanki; S. Cousens; A. Sanou; I. Diallo; and T. Mertens. 1997. "Dirt and diarrhoea: formative research in hygiene promotion programmes". *Health Policy and Planning* 12, 2, pp. 122-131.

Davis, J; and F. Brikké. 1995. *Making your water supply work: operation and maintenance of small water supply systems*. IRC: The Hague.

De Luca, L. (ed). 1999. "Labour and social dimensions of privatization and restructuring – public utilities, water, gas, electricity: Part II Europe/Latin America". ILO: Geneva, Switzerland.

Dreyer, L. 1998. *The dynamics of community non-compliance with basic water supply projects*. WRC Report No. TT 93/98. WRC: Pretoria.

DWAF. 1998a. "12 successful cost recovery case studies for water services in South Africa". DWAF: Pretoria.

DWAF. 1998b. "Sustainability management guidelines: second draft". DWAF: Pretoria.

DWAF. 1997. "Evaluation of the Community Water Supply and Sanitation (CWSS) programme: workshop document". DWAF: Pretoria.

DWAF. 1994. *Water supply and sanitation policy: white paper*. DWAF: Pretoria.

Esrey, S. 1996. "Water, waste and well-being: a multi-country study". *American Journal of Epidemiology*, 143, 6, pp. 608-623.

Esrey, S. 1994. "Multi-country study to examine relationships between the health of children and the level of water and sanitation service, distance to water, and type of water used". CIDA: Ottawa.

Gosh, G. 1999. "Community participation: key to sustainable water and sanitation program". Paper presented at the "Rural and Peri-Urban Water Supply and Sanitation in South Africa – Appropriate Practice Conference", 14-17 March 1999, East London, South Africa.

IWSD. 1994. "Regional Review of Participatory Hygiene and Sanitation Transformation". IWSD: Zimbabwe.

Kurup, K.B. 1996. *The community-managed sanitation programme in Kerala: learning from experience*. IRC: The Hague.

Lovell, C.; G. Nhunhama; S. Sunguro; and O. Mugweni. 1999. "An economic impact: productive waterpoints in dryland areas". *Waterlines* 17, 2, pp. 5-8.

Musabayane, N. 1997. "Workshop report on the review of the implementation of participatory hygiene and sanitation transformation (PHAST) in Mozambique". Unpublished.

NETWAS. 1998a. "An East Africa summary report for prospective review of participatory methods for hygiene and sanitation with a focus on PHAST". Paper presented at the Eastern and Southern Africa Regional PHAST Workshop, 9-13 November 1998, Harare, Zimbabwe.

NETWAS. 1998b. "Report on the prospective review of participatory methods with a focus on PHAST: Uganda". UNDP/World Bank Water and Sanitation Program, Regional Water and Sanitation Group for East and Southern Africa, and the World Health Organization.

Noppen, D., ed. 1996. *Village level operation and maintenance of handpumps: experiences from Karonga, Malawi*. IRC: The Hague.

Pal, M. 1998. "Taking sustainability from policy to practice: bringing poverty concerns into the project cycle". *Development in Practice*, 8, 4, pp. 454-465.

Roark, P., Hodgkin, J, and Wyatt, A. 1993. *Models of management systems for the operation and maintenance of rural water supply and sanitation facilities*. WASH Technical Report 71, WASH: Virginia.

Roark, P.; D. LaPin; and E. Kleemeier. 1992. "Sustainability Assessment for the Benin rural water supply and sanitation project". EHP: Washington.

Taylor, P. 1997. "Whose water supply? Costs, management, and maintenance in southern Africa". *Waterlines*, 15, 3, pp. 6-8.

Thomson, M.C. 1995. *Disease prevention through vector control: guidelines for relief organisations*. Oxfam: Oxford, UK.

UNICEF. 1998. *Sanitation – the Medinipur story*. UNICEF: Calcutta, India.

Van Koppen, B.; and S. Mahmud. 1996. *Women and water-pumps in Bangladesh: the impact of participation in irrigation groups on women's status*. IT Publications: London, UK.

Venter-Hildebrand, M. 1999. "Financial options for higher levels of service in rural areas". Paper prepared for Discussion Session Two: Finance, at the Rural and Peri-Urban Water Supply and Sanitation in South Africa: Appropriate Practices Conference, 14-17 March 1999, East London, South Africa.

WASH. 1993. *Lessons learned in water, sanitation and health: thirteen years of experience in developing countries*. WASH: Virginia.

Wehrle, K. 1998. "A contribution to Mvula's future to support South Africa's W&S sector". SKAT: Geneva.

Wood, G.; and R. Palmer-Jones. 1991. *The water sellers: a cooperative venture by the rural poor*. IT Publications: London, UK.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University Press: Oxford.