



SUSTAINABILITY OF WATER SERVICES TO THE POOR

A synthesis of the literature conducted for the Water Research Commission

Over the past two decades a number of international declarations have sought to ensure access to safe water and sanitation with environmental sustainability. A range of criteria and financing mechanisms has been proposed for the mobilisation and allocation of financial resources. Yet millions of people do not have access to basic levels of service and there are concerns about water scarcity and environmental degradation impacting on fresh water resources. There is increasing competition between agriculture, industry and domestic sectors for fresh water, which is a finite resource in a given environment. The global fresh water crisis is in fact a local level crisis - in time (at particular periods during the year) and in space (particular locations) - which already exists.

Nigam, A. & Rasheed, S. (1998). Financing of Fresh Water for All: A Rights Based Approach (Rep. No. Number EPP-EVL-98-003).

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1. Introduction

This review of the international and local literature is a preliminary, but essential, part of the project to explore the sustainability of water services for the poor in the new institutional and social policy context in South Africa. The project objectives involve the identification of the key elements relevant to sustained operations, the development of a diagnostic tool and method through workshops with stakeholders, and a reporting system to highlight appropriate interventions. The synthesis of international and local literature provided here is designed to provide a broad but not extensive introduction to the issues in relation to measuring sustainability and the methods which have been devised.

'Water is life' has become a phrase repeatedly used but not exhausted in its meaning as water is neither accessible to all people nor equitably distributed in most countries, particularly the poorest. In developing countries where the problem of inaccessibility is acute, poor and rural dwellers endure poor quality service. Water services often function irregularly and inadequately. Sustainability has thus become a key concept in the water sector as in the broad sphere of development, and this has been the focus of many governments, including particularly the post-apartheid South African government.

This review takes the provision of clean drinking water to the poor in rural and urban areas as its point of reference. This, in a sense is the end product of a complex of infrastructural and policy decisions; the literature is replete with a wide range of issues in relation to the provision of water. These include affordability of water services, effective and efficient water service delivery, and meeting the needs and involvement of women. In the Strategic Framework for Water Services (DWAF, 2003), affordability, sustainability, efficiency, effectiveness and sensitivity to gender issues are principles upon which water service provision rests. Collectively these principles also constitute a critical goal underlying water service delivery in South Africa (DWAF, 2003).

Of the principles, however, the concept of sustainability is at the core of the problem of water provision in most developing countries. A review of the literature identified several other concepts pertinent to sustainability as used in water service delivery, including:

- Voice and accountability
- Standards and quality of water
- Operation and maintenance of water service
- Monitoring and Evaluation
- Indicators and milestones
- Regulation of water systems

as some of the main issues for discussion.

2. Approaching sustainability

The concepts of sustainability and the use of the concept in relation to water services will be explored in all its dimensions before moving on to the specifics of key indicators and measurement.

What does the concept *sustainable* mean in the context of development and then in water service delivery? What are the key indicators of (i) sustainable development, and (ii) sustainable water service? How are the issues identified in Figure I related to sustainable water service?

Probably few words are as loaded as that of sustainability; the concept can be stretched to include every major and minor aspect of sustained operations and use of natural resources. A critical review of the discourse of sustainability argues that the term's popularity arose in the late 1980s in a political context when bureaucracies and policy makers were searching for a new role after the Cold War. "The debate promised to extend the role of bureaucracy from that of agent of policy implementation to that of significant political actor, required to select experts as well as futures." The question was whose interests were served and the author proposes in seeking 'sustainability' governments have been seeking a new tool for governing (Boehmer-Christiansen, 2002). Before approaching measuring sustainability its meaning has to be explored and then rigorously defined for the task in hand as the definitions are many. The first and most commonly quoted definition is that of the Brundtland report of 1987 (World Commission on Environment and Development, 1987): sustainable development is here defined as development that meets the needs of the present without compromising the needs of future generations to meet their own needs. This followed an era in which the earth's survival itself was the preoccupation; the new paradigm of sustainable development offered the positive promise of a better future if appropriate changes were made.

The definition appears neat and all encompassing. Two key concepts are contained in this definition, that of needs, increasingly related to the essential needs of the world's poor, to which overriding priority should be given, and the reduction of the environment's ability to meet present and future needs by social demands and the state of technology.

The concept of *limits* is a central feature of the definition. A review of sustainability firstly includes characteristics that point to living within the limits, and secondly the understanding of the interconnections among economy, society, and environment and thirdly the equitable distribution of resources and opportunities. The environmental dimension seeks the preservation of natural capital for next generations whereas the economic dimension regards the efficient allocation of environmental resources between competitive uses. Social objectives deal with the equal distribution of environmental resources and the right to benefit from basic environmental functions.

The term sustainability in the context of water services, however, is limited in its meaning and will mostly focus on the narrow context of service delivery in the fields of water supply in predominately poor rural areas. However the maintenance and protection of the natural resource base continues to be a prerequisite for sustainable water services and water resource management is inextricably part of water services.

The purpose of this work is to examine in some comparative detail the aspects of water services which lead to continuous operation, a first level definition of sustainability in this sector. The level tends to be local and the service is that directed to the poor. At a local level the sustainability of water services can according to Abrahams (2004) be defined as whether water continues to be available for the period for which it was designed in the same quantity and at the same quality as it was designed. In other words, if a person can turn the tap in 15 or 20 years time and the water comes out at the same rate and quality as the day the scheme was commissioned, then it is a sustainable supply.

According to Brikke (2000:42), a service is sustainable when:

- it functions and is being used;
- it is able to deliver an appropriate level of benefits (quality, quantity, convenience, comfort, continuity, affordability, efficiency, equity, reliability, health);
- it continues over a prolonged period of time (which goes beyond the life-cycle of the equipment)
- its management is institutionalized (community management, gender perspective, partnership with local authorities, involvement of formal/informal private sector);
- its operation, maintenance, administrative and replacement costs are covered at local level (through user fees, or alternative financial mechanisms);
- it can be operated and maintained at local level with limited but feasible external support (technical assistance, training, monitoring);
- it does not affect the environment negatively.

Both these criteria are eminently reasonable for those with adequate services but in relation to poor people policies of international organisations and governments may represent barriers in delivering and maintaining services to the poor. Policy towards the poor often does not follow the stated pro-poor stance that many institutions have now adopted. As a study has concluded: "The greatest bottleneck to getting services to the poor is indifference, and even hostility, at local, national, and international levels" (Tova et al, 1993, viii). The question is whether, through accountability achieved through voice, political representation, and official regulation a counter-balance can be established and the poor receive the clean drinking water needed to promote health and alleviate poverty.

At the outset it is necessary to discuss a definition of a sustainable water service and to discuss what level of service is being maintained. Possibly because there is such a range of levels of service and variability in operation, a standard is not much discussed in the literature beyond the connection of communities and individuals to infrastructure. In this review a sustainable water service will be regarded as a service operating to provide good quality water to meet the health and social needs of individuals and households, readily available financially and in distance from the household, and operating continuously with minimal interruption. It should be particularly within the range of access of poor people and be sensitive to the particular needs of the aged and ill, especially those suffering HIV/AIDS.

3. At what level and technology is sustainability focused?

Although there is an international debate about the sustainability of the planet conducted at international forums and phenomena such as global warming are vigorously debated, much of the context of discussion of sustainability is local. This is attractive to those encouraging community participation and direct accountability of local authorities and utilities, and this level of focus is accentuated in South Africa by the principle of decentralisation which is fundamental to local government legislation and administration. The local level is argued by researchers to be "optimum level at which to implement sustainability"

However, variability of local characteristics problematises this process as engagements with the principles and practices of sustainable development in unique places are likely to result in varying interpretations of the internationally accepted discourses of sustainable development (Houghton, 2004).

In relation to delivery to the rural poor and those living in informal settlements there is a tradition of developing projects at the local level with simple forms of technology. The concept of Village Level Operation and Maintenance Management (VLOM) is reported to have gained wide acceptance after being first proposed in the early 1980s. Project designs based on VLOM principles for communal handpumps are universal in developing countries. Although in South Africa there are expectations of higher levels of technology there has also been, until recently, the same emphasis on local community infrastructure and maintenance. Until recently sustainability has been measured at this level. Although the principle of decentralisation of management and very simple technology has characterised VLOM, the benefits have been uneven.

[I]mplementation of handpump programmes in accordance with VLOM criteria have been only partially successful and the VLOM approach to maintenance has been very difficult to realise in the field, especially in Africa. As a result, enthusiasm for the concept is now more guarded and VLOM technology is increasingly seen as only one amongst many components needed for the sustainable provision of village water supplies (Colin, 1999).

As difficulties have arisen even with the maintenance of relatively simple technology at a local level, there has been increasing doubt about the concept of 'standalone' development without external support:

Difficulties with the introduction of VLOM have called into question a number of inherent assumptions in the concept relating to the user community, the supporting environment and technology choice. Of particular importance is the assumption that introducing and supporting VLOM is an easier task for government than running a centralised maintenance service. VLOM has undoubtedly brought the answer to sustainability a little closer; however, the goal of easy maintenance remains elusive. Perhaps the greatest lesson is that there are no 'off-the-shelf' solutions which can bypass the need for effective government institutions for community support (Colin, 1999).

Both locating projects at a community level and employing simple technology alone have not succeeded in sustaining village level projects in Africa and the gaps appear to be external support either from NGOs or from government. In South Africa sustainability is now being assessed at a scale above that of the community even in rural projects as local government legislation places responsibility for services on to local municipalities.

There are other levels or contexts (such as informal settlements, schools, public facilities, etc) at which water services should be seen to operate effectively, and where there may be considerable social costs if there is ineffective or non-existent services. To take an African example of water services to schools, a study of girls dropping out of the top end of primary school is strongly related to both the lack of sanitary pads, separate toilets and lack of access to water. According to a women's organization in Uganda these issues relating to menstruation are the most important causes of school absenteeism and poor academic performance among schoolgirls. Shame and silence surround the issue (Kanyike, 2004).

In overcrowded shack settlements in South Africa there is often no running water and sanitation facilities. Informal housing development leads to environmental degradation where the removal of vegetative cover, waste disposal and water pollution are evident. Many of these settlements are situated close to water sources, especially rivers. In the absence of sanitation, these communities make use of shallow pit latrines, river banks, etc. Water quality from local sources is likely to have a high level of pathogens (Gangoo, 2003).

It is argued that greater decentralization and democratization would focus greater attention on informal settlements, but, a study has concluded, the resolution community demands "is not so simple, and it appears to take time and technical sophistication".

[M]eeting the needs of informal peri-urban settlements will require significant structural reforms that facilitate and even encourage working with the existing settlements, where the greatest need for water and sanitation exists. It also implies improving our knowledge about the urban poor. Turning around people and institutions takes time, and it takes a few good leaders" (Tova 1993).

Particularly attention thus needs to be given to sustainability of water services in sensitive situations and in communities suffering environmental degradation.

The impact of HIV/AIDS on the demand for accessible, reliable and affordable water and sanitation services has also received attention in the literature. The IRC has suggested that in countries with high or increasing HIV/AIDS prevalence, it is necessary to incorporate the demographic effects of the epidemic into the planning and design of water systems (IRC, 2003). In IRC's view, demand will need to be monitored regularly as changes may be rapid, fairly unpredictable and very location specific.

It is observed that the need for improved basic services is most urgent in urban and rural communities affected by HIV/AIDS (IRC, 2003). Current demand responsive approaches and policies that promote full cost recovery and private sector involvement have an inherent risk of further marginalising these communities (households and individuals) and jeopardising their access to improved water supply and sanitation. The IRC (2003) concludes that continued monitoring of equity and poverty indicators is required, as well as management approaches and strategies that are equitable, gender-sensitive and pro-poor.

4. Cost recovery and affordability

The current dominant model of sustainability is that of economics and finance. Universal coverage of water services requires the sustainability of projects and operations. To be sustainable, operations must be financially viable which implies the recovery of the costs of operation and maintenance, and, in some cases, capital costs as well. The issue of coverage also entails affordability, which in turn weighs on the poor. The cost of water services, the necessary functions of bulk supply, reticulation, administration, is usually accepted by poor communities; the difficulties arise in the contradiction between essential need and the means to pay. There are several possible answers to this central problem in delivery:

- the provision of free basic water (which is not unique to South Africa),
- cross-subsidization of tariffs from better-off to the poor (cross-subsidy from industrial and commercial users to residential users, and from high-volume to low-volume residential users),
- transfers from central government to the authority or provider, and
- direct subsidies to the poor.

Unfortunately there is not a large volume of research on ensuring continued supply to meet essential needs of poor families; the central feature is usually cost recovery itself with some reflections on the problems of poor households. These issues are central to much of current

debates on water services provision, and are highlighted in the literature, including Cardone and Fonseca (2003), Still et al (2003), Bond, (n.d.), and Solo, Perez and Joyce (1993). Cardone and Fonseca, for instance, discuss the issue of cost recovery, which they acknowledge, has long been a controversial issue among water supply and sanitation professionals. "Financial sustainability is a vexed issue in the African context" (Ongley, 1999) according to the author, largely because it poses acute management strain.

The controversies can be located around the opposing views of water and sanitation as 'economic good' or a 'social good'. The general view of consultants in the field is that financial sustainability is an increasingly important goal as water is an economic good and that the benefits of projects are likely to be short-lived if the projects are unable to recover costs (Still et al 2003). The context is generally local and project based rather than related to multiple levels of authority and operation.

Cardone and Fonseca (2003) maintain the standpoint that cost recovery should have a single non-ideological objective: to increase the numbers of poor who have access to sustainable water and sanitation services. The authors also favour an innovative approach to the issue of financing and cost recovery through broadening the consideration of costs, benefits and revenue streams and advocating that all the linkages are clearly defined in water services sector programming, to make the channels of cost recovery evident for the foreseeable future.

The view that water is an economic good has strong implications for the establishment of proper financial arrangements for a project. The authors propose that financial policies should send out correct signals linking service levels to actual cost, maximise cost recovery by capturing community willingness to pay, and make efficient and equitable use of subsidies.

The problem of financing water and sanitation services poses two great challenges in developing countries: The first challenge is to complete the "old agenda" of providing household services; the second is the "new agenda" of environmentally sustainable development. The approaches that Briscoe (1995) suggests in order to address these challenges have two main elements:

Institutional arrangements in which the people who are affected are put in charge of the decisions regarding both the type of service and the resources to be spent. At the lowest level this means letting households choose the services they want and are willing to pay for. At the highest level it means that the stakeholders in a river basin decide what level of water quality they want and are willing to pay for. Consistent with this participatory thrust is the dictum that decisionmaking responsibility should be moved to the lowest appropriate level. Thus, for instance, river basin authorities should concentrate on managing and pollution externalities and let municipalities decide how to manage their water and sewerage services more effectively. This inevitably means broader participation of the private sector and civil society.

Making more extensive use of market-like instruments at all levels. At the household level this means much greater reliance on user charges for raising revenues and on the private sector for the provision of services. At the river basin level it means much greater use of abstraction charges, pollution charges and water markets for water resource management.

The economic costs of interventions to improve water and sanitation services should ideally be measured against the benefits from such improvements. This is an issue addressed in a study, by Hutton and Haller (2004) who found all water and sanitation improvements to be cost-beneficial, and this applied to all world regions. The costs of the interventions included the full investment and annual running costs. The benefits of the interventions included time savings associated with

better access to water and sanitation facilities, the gain in productive time due to less time spent ill, health sector and patients costs saved due to less treatment of diarrhoeal diseases, and the value of prevented deaths. The main contributor to benefits was the saving of time associated with better access to water supply and sanitation services. When different cost and benefit assumptions were used, the cost-benefit ratios changed considerably, but even under pessimistic scenarios the potential economic benefits generally outweighed the costs.

The approaches to affordable and sustainable water service provision, especially in rural areas have included the construction and use of financial models. There are a variety of cost and tariff models being used for different purposes in South Africa including the DWAF/Ninham Shand Water Supply Service Levels model; The Mvula Trust's Help Manual on Rural Water Credit; the WRC Rural Water Supply Cost and Tariff Model etc.

The literature which focuses on the sustainability of rural services (Still et al, 2003) identifies fifteen features that a cost and tariff model, tailored specifically for rural water supply in South Africa, should have. Four of the features addressing issues of cost recovery and affordability are provided below:

- The model must reflect the effect of inflation on asset replacement costs.
- The model must allow for cost sharing between Water Services Authorities, Water Services Providers, National Government and other stakeholders.
- In setting tariffs, users must be able to use a combination of fixed charges and volumetric charges (with rising blocks, if required) for any level of service. The user must be able to specify different tariffs and charges for each different level of service.
- The model must reflect costs in terms of both volume of water supplied (R/kl) and in terms of households served (R/hh). The volume of water supplied here must exclude losses. The cost per kilolitre is important indicator of the effectiveness of a water supply scheme. The monthly cost per household served is an important indicator of affordability (Still et al, 2003).

An approach which is receiving greater attention recently and which is linked to cost recovery through minimising costs is that of water demand management which has been defined as a practical strategy that improves the equitable, efficient and sustainable use of water. It achieves this by:

- stressing equitable access to water, reflected in a strategy that is specifically designed to improve service delivery to the poor;
- treating water as both an economic as well as a social good, and managing and pricing it accordingly;
- balancing the management of losses and consumption with new or augmented supplies; and
- managing the change from a supply driven to a demand responsive culture (Deverill, 2001).

This report describes how a combination of quantitative and qualitative techniques can be used to establish water use patterns. Critically, if service providers are expected to improve the equity of water distribution, they must be able to measure water consumption within the town boundary, and not just the consumption of consumers with direct access to piped water.

5. Voice, gender and “reinventing” accountability

Given the importance attached to public participation in policy implementation in South Africa and the controversies which often relate to its practice, voice and accountability are discussed here as making a particular contribution to ensuring sustainability. The democratic traditions of the South African resistance to apartheid and the current levels of civic organization in poor communities demand attention to the representations and voices of the poor particularly in deep rural areas and informal settlements.

Voice and accountability have become key concepts in the advocacy of good governance, and it is customary for ordinary people to challenge or complain about policies that adversely affect their interests. Opinion surveys which gauge opinion in particular areas are also an indirect means of communicating voice. The issue is closely related to class: the middle class generally does not see participation in service issues as important if these are functioning as anticipated, for the poor who experience lower levels of service and more frequent interruptions,¹ participation is seen as vital to securing their access and possibly improving conditions. On other questions which impinge more closely on middle class interests, such as the quality of education, a very high level of participation is exercised, with the poor, unfortunately, at a much lower level. Democratic regulation and the forms of regulation anticipated in the Strategic Framework for Water Services certainly anticipate high levels of participation

A regulatory monitoring framework should also recognise that consumers are in the best position to monitor the effectiveness of water services provision. They are the first to experience the effects of poor, inadequate or absent services. Therefore, the most important and effective monitoring strategy for the sector is strengthening the voice of consumers (DWAF, 2003:60-61).

The debate is whether the existing representation of needs and issues through formal representative government, with councillors and members of parliament speaking for the people, is adequate or whether sectoral forums and deeper consultation gets the voice of the poor across the table. The matter seems simple: the policy for such participation is well established above, water forums have been explored, but there is decided opposition at times from politicians. Councillors at the municipal level, for instance, are at times hostile to community representatives from other parties or who openly express opposition to established practices being given an equal opportunity to speak at hearings.² From the perspective of the elected representatives such participation seems unwarranted and unnecessary, but equally community groups complain that their interests and grievances are not being adequately taken up by their political representatives.

There is an argument forcefully made, that in addition to participation of the poor generally, there should be specific provision for women. As the Strategic Framework states:

Every effort must be made to ensure the adequate and meaningful participation of women in consultation forums (DWAF, 2003: 42).

The participation of women in water committees in rural areas, the limits and possibilities of transforming gender relations through the policy of women having 50 per cent of the seats on

¹ Research undertaken by one of the authors has revealed that income is closely related to higher levels of service with fewer interruptions. There were few cut-offs at higher levels of income.

² At a Water Forum convened in Durban by the then Minister in 2004, for instance, a councillor protested against the proceedings and withdrew.

these bodies, and the effect on the sustainability of projects is extensively examined by Hemson (2002). He concludes that the rule has encouraged women's participation and assisted in strengthening the status of women in community affairs, but that the results are effectively below expectations and additional supportive interventions are needed.

Gender has been highlighted in the lessons drawn from water projects in developing countries (although, it seems, less in recent years). Fong et al (1996) make an analysis these lessons with the object of providing toolkit is meant to familiarize World Bank staff with some of the strategies and methodologies to increase participation and thus the effectiveness of projects. The policy objective is to remove barriers to women's involvement without which "the incentives to perform these tasks as effectively and efficiently are reduced" (1996,4). The document is essentially practical and orientated to the lessons to be drawn from experience which are as follows:

1. Gender is a central concern in water and sanitation.
2. Women's participation improves project performance.
3. Specific, simple mechanisms must be created to ensure women's involvement.
4. Attention to gender needs to start as early as possible.
5. Gender analysis is integral to project identification and data collection.
6. A learning approach is more gender-responsive than a blueprint approach.
7. Projects are more effective when both women's and men's preferences about "hardware" are addressed.
8. Women and men promote project goals through both their traditional and nontraditional roles.
9. Women's groups and NGOs can be effective in involving women.
10. Gender-related indicators must be included when assessing project performance and impact.

These appear fairly conventional, but that does not imply they are all are utilised and implemented. In the planning of most projects internationally there is still an absence of data on gender, for instance. The difficulties are often in the detail: what rules should be established in decentralised local municipalities for women's involvement on project committees now that councillors have to take prime responsibility?

Other research aim to detail strategies to increase women's participation in the whole project cycle and recognise that women have a special interest in the success of these projects and are prepared to make greater sacrifices:

The demand for an improved drinking water supply and better environmental sanitation is usually higher among women than among men, as shown by women's higher willingness to contribute when this aspect is investigated separately for both groups, Van Wijk-Sijbesma (1995,1).

The author quotes studies concluding that women's participation in planning and maintaining projects leads to higher levels of success.

Participation is increasingly endorsed by international institutions, although with objectives other than opposition to rigorous cost recovery in mind. The World Development Report (WDR) provides strong endorsement of participation in the following terms: "Too often, services fail the poor – in access, in quantity, in quality", (but could work for the poor) "by putting poor people at the centre of service provision: by enabling them to monitor and discipline service providers, by amplifying their voice in policymaking" (World Bank, 2004:1). The World Bank policy writers use the term 'participation' overwhelmingly in relation to the encouragement of participation of

the private sector in managing services, but community involvement is also encouraged generally with the view of people understanding and accepting the consequences of the cost implications of improved services. Specifically civic participation is encouraged as essential to the regulatory process for the following reasons:

A review of urban water utilities in Latin America and Africa concludes that giving consumers little information about the process of reform and tariff setting—and limiting their opportunity for comment before taking regulatory decisions—weakens the regulatory process and the credibility of reform, and make tariff changes—however justified—difficult to implement (World Bank, 2004, 169).

In addition the chapter on the framework for service provision is highly critical of notions of universal common interest in civil society, community and among individuals.

Terms such as civil society and community are sometimes used too casually. People differ in beliefs, hopes, values, identities, and capabilities. Civil society is often not civil at all; many “communities” have little in common. Individuals and households may disagree about collective objectives and work to promote their own views, both individually and through associations, sometimes at the direct expense of others (World Bank, 2003:45).

In short, with a view of a highly fractious civil society, despite its engaging foreword, the World Development Report does not offer any concrete proposal for the participation of civic organisations in monitoring,

Goetz and Jenkins (2001, 2004) outline some of the salient features of the new trends in accountability relationships while also highlighting limitations of voice-based approaches to service delivery which they describe as “reinventing accountability”. The new trends are characterised by conceptual innovation and practical experiment in citizen-led accountability struggles. These are hybrid forms of accountability;

either in partnership with state organizations or, more frequently, through protest action, which increasingly takes the form of civil society-initiated public hearings, people’s courts, and commissioned reports that mimic official state proceedings (Goetz and Jenkins, 2004).

However, according to Goetz and Jenkins (2004) voice is “being over-sold”, particularly as a means of securing accountability to the poor, as formal institutions are profoundly biased against socially excluded groups, denying them access and meaningful participation.

At times they manage to inform officials about public perceptions of government behavior. But they rarely include formal obligations on officials to supply answers, accounts, or other information—nor, for that matter, provisions for investigations to be automatically triggered by *prima facie* indications of corruption or poor performance (Goetz and Jenkins, 2004).

This diminishes not only their prospects for collective action, but even their ability to formulate common policy positions. From the authors’ perspective voice regulation needs to be strengthened to have greater impact even if it is “hugely unfair” to give those most afflicted the responsibility for leading the charge against elite privilege. Despite this judgment, citizen’s

accountability initiatives are credited with setting up scrutiny processes independently of official regulation and have increased the capacity of public oversight institutions.

In South Africa there is a long tradition of public participation by civil society. South Africa has a relatively mature NGO sector, active CBOs, and vigorous and often militant social movements. Participation may not be smooth and procedural and has often taken the form of protests, and outcomes have not always been without cost in one form or another. The Strategic Framework for Water Services (DWAF 2003) sets out to include civil society in regulation through engaging civil society organisations in policy development, supporting the development of capacity in civil society, encouraging civil society to monitor performance, and mobilising for civil society organisations. These are fairly strong commitments to involving the citizenry in the oversight of the management and operation of water services. They are an indication of giving a voice to the poor and promoting accountability, but civic organisations argue this has largely remained in the policy documents and statutes.

An increasing research literature examines the kind of actions that must be taken to expand voice and accountability in budgetary processes. In the context of voice, Osmani (2002) identifies three analytical categories: voice in preference revelation, voice in conflict resolution, and voice in impact evaluation. All three categories are important, at different stages of the budgetary process, if marginalized groups are to gain more from the budget or, more generally, a share of public resources than they have in the past. Voice is not sufficient, however, to achieve that goal because it alone cannot ensure accountability. The voice of marginalized groups is essentially linked to the notion of participation by the society, but even augmented participation alone is not enough to secure change. Osmani emphasizes three distinct, but inter-related, pre-requisites of accountability: namely, transparency, participation, and knowledge. Effective participation thus depends in turn on more comprehensive and living forms of democracy. In the absence of these factors participation takes the form of open and public forms of opposition to institutional rule.

Several scholars and activists, including Kaufmann (2002), Inoguchi (2002) and Naidoo (2004) echo these issues in diverse ways, with the object of increasing welfare of the poor. Kaufmann (2002) argues on the importance of transparency, incentives and prevention (TIP) in improving governance and addressing corruption. In moving towards an integrated TIP - driven corruption control approach, the importance of broadening the approach to focus on *Governance* is emphasized. Within it, control of *corruption* is *one* important component, closely linked to others, such as rule of law, external accountability, voice, and transparency. Kaufmann argues that although advances have been made in favour of transparency approaches these can only provide concrete benefits where complemented by leadership, proper enforcement, and collective involvement of key stakeholders in society for implementing institutional change.

Inoguchi stresses the role of the media and the Internet in facilitating good governance and democratic development. From the citizen's point of view the media play the role of enlightenment, i.e. informing people of important news and events that pertain to the citizen's exercise of power in influencing political outcomes (Inoguchi, 2002:33). According to Naidoo (2004) there is the need for civil society organisations (CSOs) and governments to develop a framework of engagement and partnership that will ensure that the comparative advantages of civil society can be harnessed for development.

Civil society groups in South Africa acknowledge delivery of water has been a priority for government, but question the sustainability of projects in not meeting social need. Programmes

experienced severe problems in maintaining health largely because of high tariffs. The recent cholera outbreak in rural KwaZulu-Natal where people survive on less R200 per month provided evidence that households could not pay R51 to register for continued supply of water. While water is being conserved, the health of people is under threat (Hassen, 2004).

An instrumental approach to effective voice and accountability that is gaining support is water users associations (WUAs). Vermillion (2004) argues for a broad but flexible approach toward supporting WUA's in a manner that creates sufficient support, incentives and accountability between stakeholders to enable WUA's to prosper. According to Vermillion (2004) water users associations (WUA's) require a transparent environment of support, opportunity and incentives in order to be both productive and sustainable. It requires empowerment of water users, long-term capacity building, and opening of financial and productive opportunities. In developing countries, such changes will normally require reforms in government agencies, new roles for the private sector and establishment of federations and networks of WUA's.

From the perspective of the service provider there is a literature which tends to see community participation as approximating to a demand-responsive approach and which could improve customer relations and result in substantial benefits. Management and customer care are argued to be important influences in creating the environment within which cost recovery would be more likely to succeed. According to Marah et al (2004), this includes good communications with the customers, the involvement of the consumers in project design, and providing good customer care facilities.

6. Water service standards, including water quality

Drinking water quality, especially in rural areas has always been of great concern. Microbiological contaminants can lead to gastrointestinal infections, dysentery, hepatitis, typhoid fever, cholera, and other illnesses and even to death in extreme cases (EPA, 1997; CEQ, 2004). The following sources of bacteria in drinking water are identified:

- Human and animal wastes;
- Insects, rodents or animals entering wells;
- Inundation or infiltration by floodwaters or by surface runoff.
- Any system with casings or caps that are not water-tight are vulnerable. CEQ (2004)

In most countries water quality standards are explicitly provided in statutes, and a statutorily established body entrusted with the oversight function, e.g., the Safe Drinking Water Act of the United States, of which the Environmental Protection Agency (EPA) is entrusted with the responsibility to ensure compliance. In South Africa much of the water quality standards are part of the general administration of standards by the South African Board of Standards (SABS).

In addition to standards, practical steps are often taken to ensure that pathogenic organisms do not contaminate drinking water. The main thrust in ensuring safety from health hazards has been by means of water treatment (Ryneveld, 1997). A water test, however, is the only way to evaluate whether bacteria is present in a water supply. The tests used to assess the characteristics of safe drinking water, measure, for example, turbidity, microbiological quality, ionic chemical composition, levels of acidity/basicity, hardness and radioactivity (www.sahrc.org.za; (CEQ (Online) (see Tables below).

Partial Listing of the Chemical Components of Water Quality

General Water Quality		
Alkalinity	Acidity	Biological Oxygen Demand
Chloride	Chlorine	Chemical Oxygen Demand
Corrosivity	Conductivity	Color
Total Hardness	Carbonate Alkalinity	Bicarbonate Alkalinity
PH	Taste and Odor	Turbidity
Total Solids	Total Suspended Solids	Total Dissolved Solids
Total Volatile Solids	Sulfate	Sulfite

Source: Centre for Environmental Quality (CEQ), Wilkes University, 2004

Microbiological Parameters of Water Quality

Total Coliform	Fecal Coliform	Fecal Streptococcus
Heterotrophic Bacteria	Giardia Cysts	Cryptosporidium Oocysts
Mold	Yeast	Denitrifying Bacteria

Source: Centre for Environmental Quality (CEQ), Wilkes University, 2004

Proper well location and construction are keys to avoiding bacterial contamination of drinking water. A contaminated water supply can be disinfected, but this is a task best undertaken by professional consultants (CEQ, 2004).

Water quality has increasingly been explored as a matter of taste and recent publications discuss how the current U.S. regulations can adversely impact the control of off-flavors in drinking water. McGuire (2000) argues that if consumers detect an off-flavor in their drinking water, they are likely to believe that it probably is not safe. Water utilities will therefore be defeating their best efforts to provide safe drinking water if they only meet health-related regulations and do not provide water that is free of off-flavor problems. Utilities should adopt a water quality goal that allows them to not only meet the minimums of the regulations, but also meet the customer's highest standards - water that is free of off-flavors.

7. Operation and maintenance (O&M)

Fundamental to notions of sustainability is a fully functional water service. Operation and maintenance (O&M) of water services is argued to be the key to improving the performance, efficiency and sustainability of rural water supply and sanitation services in developing countries. Often the operational aspects are discussed and introduced only after a project was completed. This neglect or delay in applying proper operation and maintenance is due to many factors, including budgetary constraints, inadequate or untrained staff, lack of tools and workshop facilities, old or unsuitable equipment, poor design or construction and lack of asset management procedures. Lack of proper operation and maintenance has adversely affected the credibility of the investments made, the functioning of the services, the well-being of rural populations, and the development of further projects. It has also resulted in environmental hazards and inequitable distribution of water services (Brikke 2000:3; Constantini and Declich, 1999; World Bank, 1982).

The term Operation and Maintenance refers to a wide spectrum of activities carried out by utilities, government and communities to sustain services and to maintain existing capital assets (WHO, 2000, 2003; World Bank, 1982) which amounts to the effective functioning of a water service. According to WHO (2000, 2003),

Operation refers to the procedures and activities involved in the actual delivery of services, e.g. abstraction, treatment, pumping, transmission and distribution of drinking-water.³

Maintenance refers to activities aimed at keeping existing capital assets in serviceable condition, e.g. by repairing water distribution pipes, pumps and public taps.

Two types of maintenance are distinguished: preventive and reactive maintenance (World Bank, 1982). Brikke (2000:41) makes a similar distinction but refers to reactive maintenance as 'crisis maintenance'.

Crisis maintenance: maintenance undertaken only in response to breakdowns and/or public complaints, leading to poor service level, high O&M costs, faster wear and tear of equipment, and user's dissatisfaction (Brikke, 2000:42).

Preventive maintenance: maintenance activities undertaken in response to rescheduled systematic inspection, repair and replacement, leading to continuity in service level, O&M costs spread over time, extension of life-span of equipment, user's satisfaction and willingness to pay.

7.1. O&M Measurement Tools

An important dimension of 'operation', which the World Bank (1982) makes explicit, is the management of client and public relations, legal, personnel, commercial and accounting functions.

In order to address the O&M problems in both urban and rural areas of developing countries, the Working Group on Operation and Maintenance of the Collaborative Council for Water Supply and Sanitation, has proposed a framework for management and tools for assessing the status of operation and maintenance (O&M) through measurement and evaluation of performance (WHO 2000, 2003). The tools include the list in the box below.

Tools for assessing O&M status in developing countries

-
- Tool 1: Effectiveness of the O&M management system
 - Tool 2: Guidelines for an audit of O&M
 - Tool 3: A framework for assessing the status of O&M
 - Tool 4: Guidelines on O&M performance evaluation
 - Tool 5: Guidelines on O&M performance reporting
 - Tool 6: Guidelines for the selection of performance indicators
 - Tool 7: Performance indicators for water supply and sanitation
 - Tool 8: Potential information sources
 - Tool 9: Participatory information gathering.
-

Source: WHO, 2000:2.

³ See also Brikke, 2000.

7.2. Other WHO O&M tools available to assist the sector include:

Case studies on operation and maintenance of water supply and sanitation systems include the following:

- Tools for Assessment of Operation and Maintenance Status of Urban and Rural Water Supply.
- Operation and Maintenance of Urban Water Supply and Sanitation Systems: A Guide for Managers.
- Leakage Control: Source Material for a Training Package.
- Upgrading Water Treatment Plants.
- Management of Operation and Maintenance in Rural Drinking-Water Supply and Sanitation: A Resource Training Package.
- Models of Management Systems for the Operation and Maintenance of Rural Water Supply and Sanitation Systems.
- Linking Technology Choice with Operation and Maintenance.

5.2.2. O&M Management Systems

The WHO (2000) also outlines the types of management systems and associated implications. Three management systems are identified, and these are shown in the table below.

O&M Management Systems

Management system	Examples	Implications
Centrally managed • Private service connections to individual plots which require supporting external infrastructure	<ul style="list-style-type: none"> • Piped water supply • Sewerage 	Public institutions have statutory responsibility for service delivery and O&M
Community-managed • Non-private facilities which are shared by members of a community or user groups; depending on the technology adopted, these may or may not require supporting external infrastructure	With external support infrastructure: <ul style="list-style-type: none"> • Piped water to public standposts • Sewered communal or shared latrines 	A group of users is responsible for O&M; if there is external support infrastructure, the roles and responsibilities for O&M need to be carefully defined between the community and the external agencies. In some cases, e.g. rural piped water, user groups may be responsible for the whole system including external infrastructure

Household-managed • Private on-plot services which do not require supporting external infrastructure	Without external support: • Communal handpumps or wells • Communal latrines linked to pits or septic tanks • On-plot wells, handpumps • Latrines linked to on-plot pits or septic tanks	Responsibility for O&M of privately owned on-plot facilities rests with the owner or plot-holder, and there is much less of a management issue here
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Source: WHO, 2000:3

On the evaluation of operation and investments the World Bank (1996) has developed three sets of indicators:

Operational Indicators,
Financial Indicators, and
Overview of Tariff Rates and Structures.

These publications include indicators from a wide range of urban centres internationally and more complex indicators, such as storage volume per person and per connection, and Unaccounted for water are calculated for key cities.

8. Monitoring and evaluating performance

Indicators are essential tools for the monitoring and evaluation of water services management and performance and are series of data or qualitative measures which provide information about a service. Attempts to measure and benchmark sustainability has given rise to the development of indicator sets and models that attempt to measure environmental sustainability as well as sustainable development. Initial indicators of sustainability addressed needs on measurement of the environment but were later augmented by social and economic indicators to assess sustainable development.

Various indicator tools or frameworks have over a number of years been developed to describe and quantify the state of environments globally. The most popular framework during the 1990's has been the Pressure-State-Response (PSR) framework, which was accepted by many countries and currently widely used. This framework, which was developed by the OECD, is an extension of the stress model of Rapport and Friend. The PSR framework in turn forms the basis for the development of both the Driving- Force- State Response (DSR) and the Driving-Force, Pressure-State-Impact-Response (DPSIR) frameworks (Scwabe et al, 2001).

In contrast to the earlier "stress-response" models, which unrealistically tried to make one-to-one linkages among particular stresses, environmental changes and responses by society, the OECD PSR framework does not attempt to specify the nature or form of the interactions between human activities and the state of the environment.

This simplified PSR framework makes the assumption that human activities exert pressures (such as pollution emissions or land use changes) on the environment, which can induce changes in the state of the environment (for example, changes in ambient pollutant levels, habitat diversity,

water flows, etc.). Society then responds to changes in pressures or state with environmental and economic policies and programs intended to prevent, reduce or mitigate pressures and/or environmental damage.

The DPSIR framework is a popular tool for organising information about state of the environment. The idea of the framework was originally derived from social studies and only then widely applied internationally, in particular for organising systems of indicators in the context of environment and, later, sustainable development.

The framework assumes a cause-effect relationship between interacting components of social, economic, and environmental systems, which are

- Driving forces of environmental change (e.g. industrial production)
- Pressures on the environment (e.g. discharges of waste water)
- State of the environment (e.g. water quality in rivers and lakes)
- Impacts on population, economy, ecosystems (e.g. water unsuitable for drinking)
- Response of the society (e.g. watershed protection).

Most of these indicators have been developed on a large range of issues, not just water, often without the involvement of the potential users (Uhlmann, 2004). The majority of worldwide indicator initiatives have also been aimed at state-of-the-environment reporting with relatively few aimed at developing sectoral indicators (Walmsley, et al., 2001).

Not all of these indicator frameworks are relevant in the context of water service sustainability but some offer useful guidelines and insight in developing indicators that relate to the environmental sustainability and quality of water resources. Environmental sustainability, however, is only one element of sustainable water supply. Other sustainability elements often include technical issues, social factors, economic elements and institutional arrangements.

According to Uhlmann (2004) most of the more than 200 water indicators and indicator sets developed to date are of environmental nature with much less attention being paid to economic and particularly social factors. Uhlman in her study of water indicators, provides an excellent example of useful social and economic indicators in support of environmental indicators in a water service delivery context.

NO.	SELECTED INDICATORS	UNITS
ECONOMIC INDICATORS		
1	Operating revenue by class (currently reported)	\$/class
2.	Payments to suppliers - O&M costs for water (as currently reported) - O&M costs for wastewater (as currently reported)	\$/system
3.	Return on assets & return on equity (currently reported)	%
ENVIRONMENTAL INDICATORS		
4	Total materials used <input type="checkbox"/> Kgs of non-chemical throughput per ML water supplied <input type="checkbox"/> Kgs non-chemical throughput per ML sewage treated. <input type="checkbox"/> Chemicals used in water/sewage treatment per ML.	Kgs/ML
5	Direct energy use Electricity/gas per water, sewerage & other + costs	kWh/ML m ³ /ML

		\$/ML
6.	Total water use (balance sheet) -Water extracted x source -Water purchased -Water supplied x customer type -Water used x application -Wastewater collected -Wastewater treated -Water discharged/ recycled -Non-revenue water -Water losses to treatment & evaporation	Throughput: ML x source ML supplied x category ML/property ML non-revenue ML wastewater ML recycled ML lost
7.	Percentage of product volume/weight reclaimed	Tonnes biosolids used /ML sewage recycled
8.	Waste generated by type & destination, including treatment (consolidation of current reporting)	Disposal sites and method, ML's, levels of treatment. Wastewater balance sheet?
9.	Penalties for environmental non-compliance	No. & severity of events.
10.	Environmental improvement expenditures	% capex
SOCIAL INDICATORS		
11.	No. & type of non-compliance health incidents (as currently reported)	No. non-compliance events x type
12.	Customer satisfaction (as currently reported)	Survey satisfaction levels

Source: Uhlmann, 2004

The idea of monitoring the performance of operation and maintenance and using the results to improve the situation is highlighted in much of the literature e.g. World Bank (1982) and WHO (2000). In the former source, the World Bank maintains that monitoring is a more reliable basis for prediction than mapping the course of a utility on the basis of known successes in other countries or even elsewhere in the same country. Monitoring shows whether an activity is improving, stagnating, or deteriorating.

The WHO (2000) describes how performance indicators can be developed and how they can be used. The WHO (2000) defines performance indicators as *variables whose purpose is to measure change in a process or function*. They are normally used in one of two ways. They may be collected at regular intervals to track the way in which a system is performing or an activity is unfolding. Or, they may be used to assess the change resulting from a particular activity or project. In the first case, performance indicators are used to *monitor* the progress of the process; in the second case, their purpose is to *evaluate* the outcome of the project or process. The WHO (2000) provides some key points relating to performance indicators, which are listed in the Box 1 below.

Key points concerning performance indicators

The following points must be kept in mind when using performance indicators:

The indicators should be truly representative of the quantities and characteristics they are intended to represent.

They should be verifiable, i.e. it should be possible to check the accuracy of the values of the indicators.

The indicators should provide information, which can be used by decision-makers; this will often mean that they are presented quantitatively.

The information must be available in time to influence decisions.

The indicators should be linked into the system to allow feedback of information for the decision-making process.

Source: WHO, 2000:3

Evaluation Tool

The Bank's 10.70, Project Monitoring and Evaluation, contains some relevant tools for effective monitoring and evaluation: access to information and acting expeditiously on critical issues, and certain types of evaluation as management tools within projects by emphasizing the importance of monitoring as an integral part of day-to-day project management, and by highlighting the advantages of lessons learnt from an evaluation of selected projects.

9. Regulation of water service

The political, social, and administrative activities involved in reviewing delivery and service can be summed up in the term *regulation*. Regulation has recently become a central aspect of the governance of water services, but the practice and its associated institutions are often contested. It promises to bring together the essential elements of monitoring, public information, representation of public interests, and maintenance of service at acceptable levels.

Regulation arises essentially from the separation between service provision and public authority, currently being applied to public services internationally. With the process of commercialisation (the administration of public services on the basis of profit) and more particularly of privatisation (the provision of services by private management), there is a radical separation between provision and authority. The need has arisen now for some form of control in the public interest. Regulation is generally thought of as being exercised by public institutions, but these are often specialised agencies not under public direction, and civil society often contends they exercise weak supervision or none at all. Classical regulation (as it has been termed) is now regarded as being equivalent to trimming the sails of service provision rather than navigating the course.

In response to the rise of civic movements internationally, the concept of regulation has been widened to include an entire range of public activities designed to actively supplement what formal institutions may be in place (Palast et al, 2003). The authors argue the case for US style regulation:

Unique in the world (with the exception of Canada), every aspect of US regulation is wide open to the public. There are no secret meetings, no secret documents. Any and all

citizens and groups are invited to take part: individuals, industrial customers, government agencies, consumer groups, trade unions, the utility itself, even its competitors. Everyone affected by the outcome has a right to make their case openly, to ask questions of government and utilities, to read all financial and operating records in detail. In public forums, with all information open to all citizens, the principles of social dialogue and transparency come to life. It is an extraordinary exercise in democracy -- and it works.

Under the often ideal conditions described by the authors in *Democracy and Regulation: How the Public Can Govern Essential Services*⁴ there is both regulation through public authorities and critical participation from civil groups and a multiplicity of combinations. Vitally important to the process is active review of every aspect of public utility operation, open access to information, civic mobilisation, critical review and legal action (see particularly chapter 5, Palast et al).

Regulation is, at times, given prime responsibility for effectively overseeing the operations of private companies. The World Bank has attributed the failure of privatisation to the weaknesses of institutions charged with the responsibility for regulating privatised utilities. The Bank asserts that credible regulation is essential to improving the performance of utilities such as water, and helping to reduce poverty in developing countries (The World Bank 2004). Regulation is thus seen as the panacea for the efficient operation of utilities to meet the needs of communities, and particularly those of the poor. But what is regulation or "regulation governance of utilities"? Is regulation, as often argued by civil groups, compromised and ineffective? What are the types of regulation? These are a few of the pertinent questions that need to be understood both in a theoretical context of public service delivery and in a given social, economic and political context.

9.1. Regulation and prescription

Regulation is also seen as a law, rule or order prescribed by a relevant authority; an instrument of government oversight that is often required in the context of public services, particularly where excessive market power exists (Hensley et al, 2003:2). Here the concept is one of defining and defending public interests in domains where the state has withdrawn from direct control and management. Regulation governance of utilities is also, however, defined more limitedly and often defined as a technical mechanism for managing utilities' performance (City of Johannesburg 2004), even though the processes are essentially political in nature.

Regulation may be viewed both as a process and as a legal setting. As a process, regulation is a compromise between direct state control and no control at all. Public services encounter conflict between commercial procedures (e.g. maximising profit), and the interests of the people using these services. Most governments have come to initiate some form of indirect control or regulation to manage this possible conflict. Regulation here is intended to ensure that a safe and appropriate service is delivered, while not discouraging the effective functioning and development of businesses.

In its legal context **regulation** is a set of rules created by an administrative agency or body that interprets the statute(s) setting out the agency's purpose and powers, or the circumstances of applying the statute. A *regulation* is a form of secondary legislation which is used to implement a primary piece of legislation appropriately, or to take account of particular circumstances or

⁴ The title of another edition stresses the control of *privatised* utilities: *Democracy and Regulation. How the Public Can Govern Privatized Essential Services*.

factors emerging during the gradual implementation of, or during the period of, a primary piece of legislation.

The key objectives of regulation, according to Hensley et al (2003), are to:

- Improve efficiency in the provision of public services;
- Prevent market power abuse by the private sector;
- Build investor confidence to attract investment;
- Build consumer confidence;
- Achieve public policy goals.

Above all, "effective regulation is necessary to not only ensure that prices are reasonable and ideally reflect the costs of service but also to ensure that the service continues to be provided reliably and that the sector is fundamentally sound" (Hensley et al 2002:3). In this schedule there is a mixture of public and private objectives although the sector appears to be corporate; political control is not included and the citizen defined as consumer. Although the points are given equal weight, the tendency in the current climate is for the third point to predominate as countries compete against each other for investment.

9.2. Regulating for the poor?

What is generally missing from the international discussion is the *regulation of services provided by the state for the poor* which are often ineffectively controlled by internal mechanisms rather than public processes. The regulation of water services and delivery runs parallel with the administrative, technical, financial and the environmental dimensions of water provision (Muller, 2003); the question is how the utilities are to be examined and power exercised in the interests of the majority in South Africa. What key regulatory issues underlie the broad policy goals and benchmarks, and the equity, sustainability and cost recovery dimensions of water service delivery in South Africa? Does the regulatory framework provide an enabling system to meeting the objective of regulation to achieve policies which is often spelt out as poverty reduction and simultaneously the encouragement of the private sector?

Regulation of water service seeks to oversee the provision of water services by rules with the object of ensuring a comprehensive coverage, as well as providing a supportive environment and incentive for providers of the service. In a paper that attempts to introduce some concepts in comparative law into the public utilities discourse, it is argued broadly that regulations may address a wide variety of issues, including the quality of the service provided, its scope and coverage, frequency or consistency, price and, in the case of drinking water services, environmental impact and conditionalities of water use. According to the author (Solanes, 2001) regulations can also address market structures, contracting practices; ownership and transfer of stock; access to infrastructure and related conditionalities and procedures; separation or prohibition of activities; transfer pricing, information, accounting, disclosure of profits, etc.

The concept and practice of regulation is contested from a number of perspectives. The questions are firstly, the argument that regulation accepts that utilities are not under direct public control, secondly, that regulators are unaccountable to civic groups and operate independently away from public control, and thirdly, that information about services is not made available publicly. From one perspective, that of social mobilisation of poor communities, regulation is a figleaf which provides cover for privatisation initiatives. It is argued to be ineffective in serving the interests of ordinary citizens and unresponsive to complaints and protests. From the side of private operators

it is argued that commercial principles dominate their practice and that this includes disclosure of information which may be in the public interest but could also be used by a competitor.

Much is argued for regulation by those advocating private management and ownership of services. When unregulated water markets allowing free rein to the private sector are found to discriminate against the poor; it is argued ineffective regulation discourages the effective functioning and development of water business. Better transactions and regulation would serve the interests both of the businesses and the poor. A number of studies (including some by researchers associated with World Bank institutions) have concluded that the current regulation is not achieving stated objectives largely because, despite much discussion, few contracts are explicitly pro-poor and the authors provide 24 guiding principles to remedy this (PPIAF, 14). Of the contracts examined in a number of international contexts, none have been found to have pro-poor legal provisions and there are limits to the contractual inclusion of those not connected.⁵ The remedies, however, appear to be unlikely to be adopted, for a variety of reasons such as uncertainty of tenure in informal settlements, adequate standards for water quality imply higher water tariffs, etc. Without the explicit contractual obligation, the service provider has no legal obligation to meet the interests of the poor.

Although some World Bank experts argue that effective regulation is the most critical enabling condition for infrastructure reform (Kessides, 2004:xii), an examination of reforms has revealed that the transactional basis generally does not mention the objectives of greater coverage of the poor nor general pro-poor goals. "The task of designing a pro-poor transaction is far from simple" (PPIAF, 2002:46), and there are conflicts between profit and provision for the poor which are not overcome through best practices and comparative case studies. By definition, the concern of the private sector is profit maximisation rather than meeting social objectives (Bayliss 2002:10) although it is argued by those advocating private involvement that social objectives are met by increased efficiency claimed for the private sector or by providing lower levels of service. The predominance of the profit principle can lead to declining coverage, lower levels of service and resistance to increased tariffs. In the context of regulation, then, how can the system be made to work for the poor? What can be done to ensure that regulators are effective and credible?

9.3. Types and principles of regulation

Regulation often takes several forms; both by subject matter such as economic regulation, social regulation and safety regulation; and by agency: i.e. public intervention, state institution or legal action. At another level, there is also regulation by institution and regulation by contract, self-regulation and independent regulation. According to the British government's Better Regulation Task Force, the intention of regulation is to achieve, fairness, effectiveness, affordability and a broad degree of public confidence (BRTF, 2003). To achieve this, the BRTF contends that regulatory models and their enforcement meet five basic principles:

- Proportionality
- Accountability
- Consistency
- Transparency
- Targeting.

⁵ Points made by Barbara Evans at the BPD Workshop on Partnerships, Brussels, 30 November 2001.

These are the broad principles to be taken into account by regulators when devising, implementing, enforcing and reviewing regulations. A good regulatory framework must, for example:

- Be balanced and avoid knee-jerk reactions;
- Balance risks, costs and benefits;
- Seek to reconcile contradictory policy objectives;
- Avoid unintended consequences;
- Have broad public support; and
- Be relevant to current conditions (BRTF, 2003).

These propositions imply an agency separate from the people but having public support, cautious, and judicious in its intervention rather than the advocates of citizen rights. This approach is that of an official agency working to bring about a “culture change” to make sure that “business and others are not unnecessarily burdened with prescriptive regulation where it is not necessary”. It is broadly empirical, examining specific measures, rather than putting forward any single approach. Although the ‘tips’ (as the BRTF recommendations are termed) are not likely to be contested they are also either bland or difficult to implement: how, for instance, is it possible to avoid unintended consequences when these are inherently unknown?

Classic regulation, in the form of laws and regulations, marks orthodox public administration precepts and practices in relation to solving policy problems (BRTF, 2003:1). This is “prescriptive state regulation”, where a law is passed “to tell people what to do or what not to do”, and in an analysis of alternatives to regulation, this is one of the five main types of regulatory tool: the others are no intervention, information and education, self-regulation and incentive-based structures. In the BRTF’s brief the regulatory procedures outlined by Palast are weakly mirrored or unmentioned. On classic regulation, for example, BRTF (2003:7) identifies clarity as one of classic regulation’s strengths; others including that this form of regulation provides “a level playing field” and also acts as a visible sign that Government itself is “doing something” about a problem⁶. The disadvantages are presented that such regulation is costly and bureaucratic, difficult to enforce and potentially inflexible (BRTF, 2003:7). Public accountability through open forums and civic action combined with ‘voice’ regulation are not considered as one of the alternatives.

There are a complex of possibilities ranging from classical or independent formal regulation combined with naming and shaming. The public disclosure of failure in public service, it does regard with considerable caution:

Naming and shaming has to be used with care. It may be disproportionate to name and shame a company with a normally good track record, for a oneoff mistake. And there may be unintended consequences if this happens (BRTF, 2003:37).

While praising forms of self-disclosure it does not endorse or review the potential for regulation through extensive public disclosure. Its conservative tone is implicit: “More is not always good. Where there is information overload, people may ignore the information provided.” (Imaginative thinking, 40). It argues that information provided on the internet is, for example, not available to all which seems to argue against providing free access to information rather than more broader access. In Britain, unlike the US tradition as developed by Palast (et al) provides exemplary

⁶ Developed particularly in Chapter 4, Classical Regulation, Palast et al (2003).

access, public access to information is not readily available and the BRTF appears unwilling to endorse open access as a measure of civic regulation.

In the current phase of the water regulation DWAF officials have given priority to what is termed "developmental regulation" in which support and advisory activities to the service provider are viewed as equally important as monitoring and enforcement (Muller 2003). The question is whether this is a top-down management approach is productive in poverty reduction strategies, and whether the Department has the ability and agility to face in two directions: both to the poor and equally to local government which is struggling to meet targets. While pre-eminence is given to the department, the paper does recognise participatory democracy in the management of the water system although usually limited to specific tasks, e.g. setting tariffs and subsidies; defining role of Water Boards and other water service providers (Muller, 2003).

In contrast both to the 'hands-off' scepticism of civil society and official regulation of DWAF, Palast et al (2003) contend that democratic regulation is the route to universal coverage of water services, lower prices, high quality service and secure employment. Democratic regulation, it is argued, *promotes* democracy, which is a prize far more valuable to civil society alone than the economic benefits democracy engenders. But it also requires deep, extensive and fully functioning democratic practices, including regulation through public review, open access to key information, and social pricing. Part of the uncertainty about classical regulation is that information is scarce and on the most sensitive issues, such as cut-offs from services, not available. While South African statutes provide for participative processes such as forums appear to be weakly developed. Undoubtedly high levels of conflict around tariff structures and access to services can make participatory processes fraught even though DWAF officials recognise that unless there is a reasonable social consensus with respect to tariffs, levels of service and rules on utilisation, effective provision of water services will not be possible (Muller, 2003). The practice to date, however, falls well short of the processes assumed by Palast and the other authors to be in place; the authors judge success or failure of regulation on the effectiveness of democratic processes often at a local or provincial (state) level.

10. A review of tools and applications

In a synthesis of the literature it is necessary to range widely over the sources to scan the wide range of findings available. It is generally agreed that the increasing pressure on freshwater resources increases the demand for sustainable development on the management of water services. The turn from unsustainable practices (which have to be defined and measured) demands "tools that measure progress and warn of future trends" (Robert et al, 2002).

The very range of possible indicators which are being isolated and tools which are being assembled to develop sustainability is daunting. Within the range of possibilities what is relevant to the matter at hand; what series of data really illuminates a central issue, what frame of reference should apply? Researchers in this field argue that although the tools and approaches appear contradictory or in competition, progress is being made if the focus on sustainability itself is maintained.

[S]ystems approach consistent with basic principles and the requirements of sustainability shows that these tools are complementary and can be used in parallel for strategic sustainable development. In fact, it is only when using these approaches outside of the systemic context of sustainability that they become contradictory. (Robert et al, 2002)

These researchers are optimistic that the essential elements for developing sustainability can be mapped and that these elements can be combined in the application of various tools. "The objective is to show how these tools and approaches relate to each other and build on each other when used for planning for sustainability".

Given the multiplicity of tools which impinge or overlap with the focus on water services every researcher in the field is compelled to compare and contrast tools and approaches, searching for a combination which has particular application.

In coming to grips with the task of providing an appropriate tool for South African conditions relating to sustainability in water services, a range of existing tools relating to water services has been assembled below to give some idea of the possibilities available. They focus widely or narrowly on the subject matter, relate to different spatial levels, and in simplicity and complexity. Some work largely from available indicators, others require the generation of data to provide indicators by various combinations.

Range of tools for measuring sustainability in water services

Name of Tool	Description
Tools for assessing the O&M management status of water supply and sanitation in developing countries (WHO). http://www.who.int/docstore/water_sanitation_health/wss/flyer3.html	A framework that assess the status of operation and maintenance of water supply and sanitation utilities through continuous measurement and evaluation of performance.
List of sustainable water catchment indicators (Walmsley). http://www.wrc.org.za/archives/watersa%20archive/2001/October/1412.pdf	A list of indicators that include water balance, water and pollution, resource condition and policy and management issues.
Sustainability Reporting Guidelines (GRI). http://www.globalreporting.org/	The Guidelines for a globally accepted sustainability reporting framework which can be applied by any organization in any field, with indicators grouped under economic, environmental and social and then according to category, aspect, and type of indicator.
IBNET Benchmarking Toolkit. http://www.ib-net.org/index.asp	IBNET provides access to the world's largest database of cost and performance information for water and sanitation utilities around the world. IBNET allows you to make customized inter utility comparisons based on a standard set of performance indicators available on the internet.
A tool for the assessment of water supply systems for small towns (GTZ). http://www2.gtz.de/ecosan/english/publications.htm	This tool can be used for the assessment of water supply in small towns and uses indicators for water supply situation, sustainability and external factors. Institutional performance of both formal and informal institutions can be evaluated.

<p>Sustainability management guidelines (Abrams, Palmer & Hart).</p> <p>http://www.thewaterpage.com/Documents/Sustainability%20_Management_Guidelines.PDF</p>	<p>Management guidelines that translate the concepts of sustainability into specific guidelines applicable from national to local levels of sustainable water management.</p>
<p>A toolkit for water quality monitoring for local government (Liverpool City Council)</p> <p>http://www.wsroc.com.au/wqm/about.html</p>	<p>WQM provides a tool that assist with the understanding of patterns and trends in the condition of waterbodies, along with ways to evaluate the effectiveness of management practices.</p>
<p>RWSS toolkit for multi-sector projects (World Bank).</p> <p>http://www.worldbank.org/watsan/rwsstoolkit/why_unique.htm</p>	<p>The rural water supply & sanitation toolkit for multi-sector projects assists with understanding the nature, strengths and weaknesses of RWSS and helps project teams to design interventions that have the greatest chance for sustainable service delivery. Emphasis is on community driven development.</p>
<p>Toolkit on gender in water and sanitation (World Bank).</p> <p>http://www-wds.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000094946_00121301483084</p>	<p>Since the International Drinking Water Supply and Sanitation Decade and the Fourth World Conference for Women at Beijing, women are now widely recognized as playing a central part in the water and sanitation sector. This toolkit shows why attention to gender is important and how much attention can be ensured.</p>

Without the reader visiting each website it is difficult to get an idea of what is available, and some exposure of one of the tools is now presented in the 'Liverpool City Council' water quality management (WQM) toolkit.

This has application for a range of stakeholders of uneven involvement and training at the local government level. It provides interesting possibilities of not only assisting local government staff who have direct responsibilities in water quality monitoring but also other stakeholders such as Councilors; other Council staff, especially management; those involved in water quality management who do not work for local government such as community environmental groups; water industry practitioners; and students.

This toolkit provides for the creation of a process that starts of with strategic considerations right through to water quality assurance, control, reporting and dissemination of information. This process also provides for a feedback mechanism where water quality data and information supply input that continuously informs strategic considerations and simultaneously improves the design of the water quality management program (see figure below).

Flow chart: improving water quality

Benchmark	Indicator
Access to water	The rate of reduction in the number of households in the WSA area without basic water supplies.
Free basic water	The number of domestic consumers (and proportion of total) who must pay for services even though they have access to just a basic water supply service and they use only a basic amount.
Water Quantity	<ul style="list-style-type: none"> - Rate of reduction in the number of persons or households consuming less than the fixed minimum quantity of water per person or household per day. - An increase in the minimum level of consumption or quantity of water consumed per person or household per day.
Public Participation	Increase in the rate of public participation in the decision making process of Water Service Authorities, water boards, commissions etc
Continuity of water supply	Number of households (and proportion of total households supplied by formal piped systems), which experience frequent interruptions in water supply service.
Water Quality	Consumer perception indicated by number of households not receiving water of adequate quality.
Cost of Regulation	Keeping cost of regulation to a reasonable minimum that does not compromise efficiency and affordability
Externalities	<ul style="list-style-type: none"> - Reduction in the social cost of the production and consumption and discharge of wastewater; - Reduction in volume of discharge of sub-standard wastewater. - Low pollution levels
Affordability	Outstanding debt for water and sanitation services for all consumers expressed as debtor days (Note: This is also a measure of the efficacy of revenue collection).

Source: Hemson and Owusu-Ampomah, 2004

12. Public health; assessing the impact of water services

The first priority assumed for water services is that of maintaining and improving public health; the health of rural people and the poor is considered to be immediately improved through the implementation of infrastructure. Unfortunately there are often significant lags in health impact; and the matter has not been explored exhaustively for a number of reasons, not least that baseline health data is usually unavailable and the subject appears to be low on the research agenda. Other reasons include the irregularity and poor functioning of water supply systems, cost recovery and water tariffs, a lag in the provision of sanitation well after that of water, but most significantly in the literature that household and personal hygiene do not readily change.

The subject is extensively explored in *Sustainability Changes in Hygiene Behaviour*, International Scientific Cooperation Projects (1998) which assesses the endurance of improvements in hygiene behaviour after health programs have been implemented. It quotes research conducted in 1984 that concluded hygiene promotion could reduce morbidity by 14 to 48%. There is considerable debate, however, about the link between infrastructure in place (for example a standpipe or Ventilated Pit Latrine), health promotion, and lasting improved hygiene and health. Many water services have been implemented without health promotion and surveys report continued diarrhea. The cholera epidemic in South Africa, for instance, had its epicentre in a community with a fairly well established water service (Hemson and Dube, 2004). It is incontestable that handwashing is

related to diarrhea, as Curtis and Cairncross (2003) have established, the problem is to relate the practice of handwashing to water services. In a number of studies handwashing is not related to water services. Most studies which do, work with data collected about *infrastructure* in place rather than infrastructure which is operational and providing adequate water. A study of handwashing in a rural area of South Africa has, however, indicated that the availability of adequate quantities of water is crucial to the practice of handwashing (Hemson et al, 2004).

The literature does conclude that health promotion, particularly if prolonged and intense, does effect improved hygiene practices and that these last (Cairncross and Shordt, 2004); the problem is that there is often little effective health promotion in informal settlements and rural areas and that the studies have to be those where such promotion has taken place.

The problem with much of the research in general is that there is a low level of cooperation between the agencies implementing and health authorities. In South Africa very rarely is there effective communication and coordination, even though this is prescribed in planning templates. Measurement of health impact of water projects is not undertaken and health statistics in communities over a period are difficult to locate. Research which is invariably undertaken well after projects are initiated and baseline data is not available. It appears that this is an international problem as the literature on the health impact of water projects is very thin. An authority in the field makes the following bleak assessment:

Attempts to measure the health impact of water supplies and sanitation have a long and chequered history. Many of them have been made by amateur epidemiologists at the behest of the agencies funding the construction of the facilities, and with insufficient planning and rigour. Even some studies supervised by eminent specialists have produced almost useless or meaningless results, after taking years to complete and costing substantial sums of money (Cairncross, undated).

Since the outcome of water services is the hoped-for health improvement, this should be seen as not an extraneous offshoot of improved services but actively monitored and evaluated. This is unlikely unless considerable efforts are made to introduce cooperative interaction at national, provincial and local level between water and health authorities.

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