DRAFT FINAL POSITION REPORT

Department for International Development:
Knowledge and Research (KaR) Projects

Cost Recovery in Water and Sanitation Projects

Contract No. R7384

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ERM Reference 6278

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For and on behalf of
Environmental Resources Management

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EXECUTIVE SUMMARY

Background

This is the draft Final Position Report for the Department for International Development's Knowledge and Research Project R7384, entitled Cost Recovery in Water and Sanitation Projects.

The project has been managed by Environmental Resources Management (ERM) Ltd. The key research associate in the project was Dr Dominic Moran at the Scottish Agricultural College, in Edinburgh. The project lasted September 1999 – March 2002.

The purpose of the project was "to review and interpret cost recovery mechanisms across a wide range of water and sanitation schemes in order to recommend a portfolio of best practices for achieving financial sustainability and maximising the potential for private sector partnerships".

The investigation focused particularly on cost recovery for water and sanitation schemes in rural and peri-urban areas. This is because it is here where people are generally the most poor and cost recovery/private sector involvement is presumed to be most difficult. Geographically, the research focused on the experiences and challenges of South Africa and India. Key research activities included:

- *A literature review*
- *An analysis of data obtained from a survey on cost recovery in WATSAN*
- *A meta-analysis of willingness to pay papers*
- *Field visits to projects and policy makers in South Africa and India*

Our key findings are presented and practical and strategic recommendations are made for designing cost recovering WATSAN projects, programmes and policies for poor people in rural or peri-urban areas. They are based upon an assimilation and comparison of our findings drawn from across our investigations.

Key Findings

Financial Sustainability

Most practitioners focus on the financial costs of projects and how to recover them. Few focus on economic costs, or values (opportunity or environmental costs), though these can be extremely important to society as a whole.

In terms of financial costs, not many water and sanitation projects or programmes in rural and peri-urban areas recover more than operation, maintenance and a portion of their capital costs. This means that long run financial sustainability in the rural and peri-urban WATSAN sector is rare.

Cross subsidisation doesn't really work and is extremely difficult to reconcile with first-best cost recovery principles. Cross-subsidisation or "free water" policies can make it difficult for the service provider to bill or collect their dues from many of their poorer users, aggravating cash flow and financial sustainability problems. Social

tariffs can also create disincentives for urban providers to expand their services into low-income areas, and are difficult to implement in non-networked rural areas.

Furthermore, Donor Agencies themselves are not very good at achieving long run financial sustainability in their WATSAN investments, especially in rural and peri-urban areas. They tend to aim to recover operation & maintenance plus a portion of capital costs. Private sector agencies (IFIs and the private sector), however, tend to aim for operation and maintenance costs plus replacement, interest, capital costs, and costs of future expansion. The Donor Agency aims have a more public sector focus – they reflect a desire to meet basic needs, to ensure an equitable use of the subsidy and to break even. The private sector aims reflect a desire to obtain an operating surplus or a return on the assets. Private sector projects, however, tend to work with slightly wealthier consumers, mostly in urban areas. Nevertheless, the private sector aims are financially sustainable; the public sector aims are generally not.

Financial sustainability is important because there is simply not enough public sector money available to either fund all of the water and sanitation projects and programmes required for poor people in rural and peri-urban areas, or to continue to fund the existing investments when their assets need replacing. Somebody has to pay for water and sanitation projects, in the long run, and this will have to ultimately be their users.

The challenge is how to retain the positive components of the public sector WATSAN programmes (equity, poverty-focus, participatory etc), whilst making them as good as the private sector projects at achieving long run financial sustainability.

Taking Account of Demand

To make water and sanitation investments more financially sustainable, it is generally agreed that it is useful to design them around what users want and therefore what they are willing to pay for. This is broadly known as taking a "demand responsive approach", the details of which have been encapsulated by various World Bank publications. However, many sector professionals have interpreted this approach in a mostly financial manner, using it to try and find better ways to discuss with potential users the most affordable option to choose from a range of technical, low cost technologies. This is misleading.

In fact, a truly demand responsive approach and the willingness to pay (WTP) estimates it derives from potential users, sits more closely with economic assessments of value than financial assessments of costs. Within a WTP bid, evidence suggests that respondents will place a value not only the technical option on offer and its cost to them, but also the institutional arrangements, the management set-up, the suggested pricing schedule and other attributes of the water and sanitation "product" on offer. Hence, the water and sanitation technology may stay the same (constrained by logistical or engineering limits), but ways and frequencies of paying, collecting fees, managing, owning or using the product can be worked upon, causing people's WTP to change, depending on their preferences.

This is supported by our other findings. For example,

- *Household income, though important, is not the overriding determinant of demand for improved WATSAN services. Poorer people see water as a*

relatively income inelastic good and are willing to pay for it, especially in drier areas. The way they are asked to pay for it, however, will affect how much they are willing to pay.

- *Financially sustainable WATSAN projects seem to work by translating users' notional demands (what I would like) into effective demands (what I can afford) for water and sanitation investments.*

- *To achieve this, financially sustainable WATSAN projects for poor people often include the development of a source of community finance to help users pay for the improved levels of services, as part of the project design and implementation process. Credit, savings clubs or revolving funds can bind people to repayment and can lead to growth and sustainability of the system*

What Works

The projects that are financially sustainable seem to have tapped into poor people's notional demands then found ways to make the project derive a return from its assets that allows it to finance itself. They tend to be locally run, easily replicable, but dependant on a wider decentralisation policy within which to work. They have mostly benefited from a "seedcorn" grant and parallel community financing mechanism. The poverty of their participants does not seem to have been a constraint to their success. Unfriendly wider policy environments have.

To achieve financial sustainability in WATSAN projects, therefore, a range of complex and critical issues need to be worked through at project, programme and policy levels. Many of these issues may require shifts in the policy and approach of the Donor Agencies themselves.

<u>At the Project Level.</u>

In order to encourage successful, cost recovering WATSAN projects that deliver financially sustainable services to the rural and peri-urban poor, it is vital to:-

- *Work at the local level on small scale projects*
- *Develop partnerships between local users, local NGOs or community based organisations and local (private/informal sector) water providers.*
- *Undertake an iterative process with local focus groups to design a demand driven WATSAN "product".*
- *Focus on the output of the project required and work backward to develop a locally owned process that will make it work.*
- *Provide small amounts of community financing or "seed-corn" grants to kick the process off.*
- *Get the users to find a way of managing costs and making the initiative pay for itself in the long term.*
- *Focus on locally based systems of fund collection and project management, which are transparent and locally accountable.*

Importantly, success at the project level will be measured by staying power and local replication, with minimal resort to grant financing. If people replicate the WATSAN project, with no external grant funding, they obviously like it, want it and are willing to pay for it. If the project remains, longer run costs are de facto being recovered

At the Programme Level

A number of key issues seem be important to help design a WATSAN programme in rural and peri-urban areas that delivers financially sustainable projects.

Think small.
Many smaller schemes should be encouraged that suit their particular users best. This could be on a village by village or on a slum-by-slum community basis. Smaller schemes mean lower exposure for the users to the risk of financial failure. Micro-networks, or non-networked systems, with up to about 30 households per group seem to be a feasible size for success.

Think many.
Pepper a neighbourhood, or rural area with several small schemes, each having been iteratively designed to suit very local needs. Local information exchanges will create the most effective hybrids.

Think unsystematically.
There will be many different ideas and approaches as to what may work. By taking an output based approach, it doesn't matter so much what the design of each local project in the programme is (as technical options are limited, people may choose differences in the institutional, payment, management options), so long as minimum (technical, social, environmental) criteria are met and the project delivers the output required. With a stake in their own project, people will also choose their options carefully to match their local conditions.

Use Grassroots Organisations to help design and deliver local projects.
There are usually grassroots organisations such as local NGOs, community based organisations, community groups or local vendors, private sector actors or informal service providers, who know who the local users are, what they want and what they will pay for in terms of WATSAN services; or who can find out quickly and efficiently if not. The programme should use them to identify the initial desires of the community and also assess the potential of these grassroots organisations to be local WATSAN project service coordinators.

Use an in-country Partner Organisation as a knowledge manager.
An in-country Partner Organisation should be used to identify and maintain this grassroots network, and to help each of the local groups form the right partnerships to develop and manage their small-scale WATSAN project with the local users. The Partner Organisation should have a good contact network of local WATSAN-focused grassroots groups, ad well as regional level suppliers, State Water Agencies and the larger private sector actors. The Partner Organisation for the programme may be a well-established national NGO, the country representative of an INGO, or an in-country engineering or consultancy firm. It should manage the grassroots organisations and their implementation of local WATSAN projects via simple, performance based, or output-focused contracts.

In turn, the Partner Organisation should be evaluated based on how many local WATSAN projects are created and then sustained, and how many are replicated; success should not be equated to how much money was disbursed (in fact, the reverse) or what technologies were used. Innovations in terms of local management, payment and financial structures should be looked for, successful ideas encouraged and knowledge transferred between users. Key indicators such as for social development,

environmental and health should be monitored and evaluated at key points in contract renewal, and the contract refocused or re-tendered if needs be.

Use a Private Sector company to oversee the Programme Contract.
Development Agencies find it difficult to manage WATSAN programmes with a private sector mindset. They look for break-even, or equity related markers in relation to financing and do not have strong internal incentives to create sustainable financing arrangements for their investments.

The Agency should place the overall WATSAN Programme Management in the hands of an international private sector company, with the responsibility for purpose level, output delivery being theirs. The Company will be able to interact with the Agency, the Partner Organisation and the State Partner in terms of the provision of training, technical advice, strengthening of financial sustainability issues, monitoring and evaluation and other key performance indictors of interest to the Donor Agency. With overall output achievement resting with the Company, not the Donor Agency, the Agency can replace the Company and the integrity of the programme with the recipient State Government and its population will remain. Disbursements to the Company could be sequential, and based upon outputs being achieved.

No Easy Money at any stage of the programme.
Many examples show that if poor people want a WATSAN investment, in most cases they will pay for it or seek ways to help them pay for it. New projects should not grant invest more than 50% of capital costs. Supporting financial mechanisms are important to help people pay for the remainder. To start with, some seed-corn money, disbursed by the Partner Organisation to the local service provider, may be required either for capital investment or to kick start savings schemes to help pay for the local WATSAN projects. Following this initial injection of funds, all long term costs for the project should be sought from its users. Replication should not require any further capital investment grants to the same level - new users should seek to draw mostly upon the financing mechanism of the original project and the surplus it produces.

Take an "output-based" approach at all levels of the programme.
An output-focused approach can help the programme to deliver. It can provide clearer thinking about the use of any subsidy on offer (perhaps directing funds to the one-time costs of service connection, rather than the ongoing costs of consumption); and about the objectives of the programme that need to be met (financial sustainable, self replicating local WATSAN projects), so that contracts can be renewed or payments made to service deliverers, at all levels.

The demonstration effect works well.
The demonstration effect is a critical factor in success, not only on a community-to-community basis, but also in terms of changing the mindset of local WATSAN agency staff, local, regional and national decision makers, and donor agency WATSAN personnel.

Don't ignore the State.
However ineffective or awkward the state WATSAN service agencies and decision makers may be at first, they must not be ignored. They can continue to implement their schemes alongside the programme, if necessary. However, once some grassroots successes are seen, their opinions on payment levels and management innovations will probably change. Then the challenge will be to build capability within the state agencies in financial understanding and local contracting/ regulation/ evaluation

procedures, so that the local state structures can gradually take the reins from the private sector company. To move from a supply and target driven mindset in the state WATSAN agency to one of managing contracts focused on outputs, is difficult. However, the "seeing-is-believing" aspect arguably provides a more powerful steer than simply building capacity.

At the Policy Level

The most prevalent obstacle to achieving cost recovery was found to be political interference, inappropriate public policy or a lack of political willingness to institute cost recovery mechanisms.

A clear policy that encourages the sustainable financing of WATSAN services in rural and peri-urban areas is therefore important. The objectives of the policy should be as follows.

- *To decentralise WATSAN responsibilities for financing, implementation and development to the lowest possible level of decision-making.*
- *To provide a legislative and regulatory environment that allows and helps the poor to undertake and manage their own WATSAN projects, with supporting agencies and information available if required.*
- *To promote local partnerships between community groups, NGOs, the local private sector and Government Agencies to help deliver WATSAN services in these projects.*
- *To develop self-sustaining community investment finance initiatives to help poor people finance the WATSAN schemes they want.*
- *To focus pro-poor WATSAN design only on those outputs that sustain themselves financially in the long run. Only those that are designed to be financially sustainable should be able to access supporting funds.*
- *To promote the need for iterative, demand focused design processes that can strengthen key parts of the WATSAN "product" to suit local conditions, for example particular institutional or payment arrangements, or certain technical components, such as sanitation.*
- *To ensure that water resources management issues are considered in the design, pricing and financing process.*

Agreement by donors and government agencies on the core objectives of this policy is also essential.

Role of the Private Sector

There is a wide range of private sector roles at all levels within the WATSAN sector for delivering financially sustainable projects, manly as thy are best at doing so. The most viable private sector participation options at project level for rural and peri-urban communities occur at the local level. They include the role of grassroots or community-based organisations and small-scale contractors and local suppliers.

Some of these organisations already run their local WATSAN project in a "private sector" manner; they employ local people or sub contractors; they manage their water and sanitation charges to provide a net surplus on their short run costs; and they invest the surplus in wider community development issues, or back into the WATSAN scheme. Several projects in India show how this can be the case. Local level NGO, or community decision-making forums can play a critical facilitation and regulatory role in this process. Furthermore, the local private sector can also

contribute to much of the supply chain for inputs to these local projects, striking competitive sourcing deals with local users.

At the programme level, an interesting role for the private sector within country is in the potential formalisation of relationships between these small-scale private sector suppliers and a larger WATSAN supplier is in the form of locally established partnerships. Sector reforms in South Africa demonstrate a range of permutations for such management arrangements.

A further role for the private sector at programmatic level is to manage the programme on behalf of the Agency in an output-focused manner, which puts financial sustainability issues at the heart of its operations, drawing on its experience and skills of managing WATSAN projects for profit in developing countries. This role may attract international water utilities, but the role of engineering or consultancy firms who have a broader set of "developmental" skills in project and programme management, may also be appropriate.

Accompanying Guidelines

Another output of this project is the development of some practical guidelines, focused at the project level. The guidelines will include:

- *An overview of how to take these silver-bullet issues forward at the project level to design a cost recovering WATSAN scheme in a rural or peri-urban setting.*
- *A more detailed focus on how to design and development strategic WATSAN project investments for the chronically poor, using more of a livelihoods-based approach to develop critical assets.*
- *A suite of annexes providing technical information on how to calculate the cost of WATSAN projects in rural and peri-urban areas that need to be recovered.*

Comments

While we feel that some key steps have been made through this research in the development of practical recommendations for designing financially sustainable WATSAN projects for the poor in rural and peri-urban areas, there are a number of exciting opportunities emerging for further work, whose outputs could feed usefully into the policy agenda on this issue. These opportunities can be split into more blue skies research and more action-research orientated exercises.

Blue Skies Research

- *The undertaking of further analysis of the valuation of key attributes of the wider WATSAN product, through perhaps the development of conjoint analysis as a demand assessment tool.*
- *The undertaking of further analysis as to the potential use of a much wider meta-analysis study to provide pointers on the key drivers for demand for rural and peri-urban WATSAN services, perhaps in particular geographical regions or for particular types of technology, or income groups.*

Action Orientated Research

- *The development of the strategic policy and programme design framework on financial sustainability in the WATSAN sector, which we have presented in this report, to draw upon a more global set of country experiences and WATSAN professionals, perhaps through partnership with the World Bank or the UNDP/World Bank Water and Sanitation Programme, or other key WATSAN institutions.*

- *The implementation of a small programme of projects, based upon the recommendations we have developed. ERM together with Water Aid would be happy to trial such an approach in a pilot project for DFID, perhaps in India, or East Africa. A key output would be to show that, with minimum grant based inputs a cluster of financially sustainable and self-replicating WATSAN projects can be developed in partnership with poor users in rural or peri-urban areas.*

1 INTRODUCTION

1.1 ABOUT THE PROJECT

This is the draft Final Position Report for the Department for International Development's Knowledge and Research (KaR) Project R7384, entitled *Cost Recovery in Water and Sanitation Projects.*

The project has been managed by Environmental Resources Management (ERM) Ltd. The key research associate in the project was Dr Dominic Moran at the Scottish Agricultural College, in Edinburgh. The project lasted September 1999 – March 2002.

The purpose of the project was

"To review and interpret cost recovery mechanisms across a wide range of water and sanitation schemes in order to recommend a portfolio of best practices for achieving financial sustainability and maximising the potential for private sector partnerships".

The investigation focused particularly on cost recovery for water and sanitation schemes in rural and peri-urban areas. This is because it is here where people are generally the most poor and cost recovery/private sector involvement is presumed to be most difficult. Geographically, the research focused on the experiences and challenges of South Africa and India.

Specifically, the project aimed to:

- Provide more depth of understanding on the issues of demand assessment and cost recovery in water and sanitation programmes, particularly through analysing actual project case studies and undertaking a methodological review of field practices, in order to provide recommendations on how best to implement financially sustainable programmes for poorer customers.

- Produce a practical set of guidelines on "how best to undertake initiatives to strengthen cost recovery". These will focus on the more financially "risky" areas of water and sanitation supply such as rural and peri-urban areas.

This position report reflects the first of these aims.

The guidelines, which form a sister publication to this report, reflect the second of these aims. They form a separate report.

1.2 *CONTEXT AND RATIONALE*

Chronic weaknesses or outright failures often exist in the delivery of state owned or managed water supply and sanitation (WATSAN) services in developing countries, especially in the relation to issues of upkeep and maintenance. This problem is usually worse for consumers in rural areas, in city slums or those in peri-urban townships - they hold less political clout than the middle classes in the urban centres and issues usually have to reach crisis point before some capital investment from the municipality takes place. However, the deep-rooted problem of moving away from crisis management and towards the long-term financial sustainability of WATSAN investments in these areas remains.

Private sector participation is less likely to occur in these "riskier markets". And poor people will not pay willingly for a publicly funded investment that they do not really want or feel they have no control over. With a subsequently under-funded WATSAN investment providing low quality or unreliable services, most poor people are forced to go elsewhere for their needs, usually at a high cost.

Thus, finding out how best to design and implement WATSAN services that are financially sustainable for poor people continues to be a real and practical challenge facing the international donor community, especially in rural and peri-urban areas.

For DFID finding out more about cost recovery in WATSAN projects and programmes is a key issue, for the following reasons.

- Within the context of DFID's overall strategy for aid delivery through budgetary assistance initiatives that seek to improve the efficiency of existing state programmes, it is of central importance to provide practical guidance to partner governments on how to design financially sustainable WATSAN projects for the poorest.

- The reform process of many WATSAN sectors in developing countries often includes a longer-term strategy to encourage more private sector investment, in order to relieve the burden on public finances. Through encouraging the promotion of cost recovery and financial sustainability in publicly funded WATSAN programme strategies for the poor, it is hoped that commercial investors will increasingly "buy into" them over time. Practical guidance on how to move the design of a poverty-focused rural/peri-urban WATSAN programme towards increasing such private sector "buy in" is therefore of great use.

- Despite commonly inadequate levels of service provision, the objectives of national water strategies are often politically targeted toward the poor, for example, through the use of cross subsidies between urban and rural or commercial and domestic users to keep costs low or zero for poorer users. Conflicts can thus occur in reconciling these existing political priorities

with the need for strategic changes that design and price WATSAN services for the poor to encourage financial sustainability.

- To some, it often seems inappropriate to think about charging often very poor people for their water and sanitation services. This viewpoint can hold much sway with many decision makers. Similarly, the idea of asking poor people how much they are willing to pay for their WATSAN services, and designing a system based upon their answers also seems problematic. Quite simply, how are poor people supposed to afford to pay? Practical guidance on how to show that poor people can and, given the right circumstances, will pay for WATSAN services they want would be welcomed, in order to help inform an often fractious debate on demand. As the March 2001 DFID paper entitled Addressing the Water Crisis mentions, implementing a demand-responsive approach needs more work on policy and practical levels.

It is within this context and rationale that this research has been undertaken. We hope that our findings can feed directly into policy and strategy development for rural and peri-urban water and sanitation provision in many of the poorest regions of the world, both for DFID and for other development agencies and private suppliers.

1.3 *RESEARCH ACTIVITIES*

During the inception phase of this project, four key research challenges were identified:

- Identify (case study) projects/frameworks/methodologies claiming to cost recover using a demand focused approach. How much choice are communities afforded? If successful, how are they doing it? Did they really tap into people's demands?

- Determine the most useful payment vehicles, which translate demand focused exercise findings into cost recovering tariff structures.

- From discussions and an analysis of available evidence, evaluate whether a role for the private sector in WATSAN enables the demand assessment/cost recovery process to be better achieved.

- Develop a framework for a fluid, demand-focused approach, building on peoples' experiences of what works, and based on getting the price/quantity balance just right, that can maximise the chances of cost recovery for WATSAN projects in for poor people in rural and peri-urban areas.

Over the two years of the project, key research activities to address these four challenges have included the following:

- Reviews and quantitative analyses of the cost recovery literature to see what the key issues are with respect to users paying for WATSAN services and recovering costs;

- Liaison and discussion with, and surveys of, key stakeholders to draw together and analyse a comprehensive set of case study material on cost recovery initiatives

- The identification of key similarities and differences within these case studies - what seems to be the critical factors for success or failure?

- Analyses of those key WATSAN initiatives with the potential for long-term private sector partnerships.

- Field visits to projects and policy makers in South Africa and India

1.4 *STRUCTURE OF POSITION REPORT*

This position paper is structured as follows.

- *Section 2 -What is Cost Recovery?* This section provides an overview of the theory of cost recovery thinking for WATSAN projects;

- *Section 3 - What seems to be important?* This section provides an assessment of the current state of understanding and implementation with regards to cost recovery in rural and peri-urban WATSAN projects, drawing on both the results of our desk-based research (literature review, survey, meta analysis) and the results of our field investigations in South Africa and India.

- *Section 4 -How to make it happen?* This section presents of a series of steps and recommendations outlining, from the evidence we have seen, the best way to maximise cost recovery in WATSAN programmes, in order to ensure the maximum chance of financially sustainable initiatives for the poor in rural and peri-urban areas, particularly in India and South Africa.

- *Section 5* presents some brief comments on the directions this work could be taken next.

There are six annexes to this paper.

- *Annex A* presents the Logical framework for the project;
- *Annex B* presents a literature review
- *Annex C* presents an analysis of data obtained from a survey on cost recovery in WATSAN
- *Annex D* presents a meta-analysis of willingness to pay papers
- *Annex E* presents a detailed overview and case studies in India from our field investigations.

- *Annex F* provides a detailed overview and case studies in South Africa from our field investigations.

2 COST RECOVERY - WHAT IS IT?

2.1 INTRODUCTION

This section provides a definition and context to the term cost recovery.

Real economic constraints on central government funding have led to the consensus view that communities themselves have to carry some of the costs of service provision (Garn, 1998; Katz and Sara, 1998; Mvula, 1998; 2000; Rall, 1998; Sara, 1998; Breslin, 1999; DWAF, 1999a; Goldblatt, 1999; Jackson, 1999; International Research Centre (IRC), 2000). However, the definition of cost recovery has become confused as disciplines - principally engineers and economists - talk at cross-purposes, mixing financial and economic interpretations of cost recovery.

2.2 FINANCIAL AND ECONOMIC INTERPRETATIONS OF COST RECOVERY

There is a subtle distinction between financial or economic cost recovery, which gives different perspectives on how one views the sustainability of WATSAN projects.

- It is possible to discuss cost recovery in relation to the setting of prices/tariffs according to financial costs, for a given project or programme. This is the common point of reference for most WATSAN stakeholders in the cost recovery debate.

- The economic value of water implies a broader assessment to society of the cost of supply and the value of water in its competing uses. It is possible to consider both tariffs and economic appraisal using this broader set of prices, or values. More economists take this viewpoint, when talking about cost recovery.[1]

It is thus possible to talk about cost recovery in a project or programmatic sense that isolates the investment from the wider water resource environment. However, in doing so there is a risk that the project may be financially sustainable without necessarily being economically so (it recovers its financial costs, but uses up groundwater too fast, without paying for the cost this incurs). Strictly, therefore, cost recovery is inextricably linked to the idea of treating water as an economic good.

[1] The distinction between these two interpretations has been further complicated by the simultaneous and related debates about treating water as an economic good and the meaning of a rights based approaches to WATSAN supply.

Thus, the definition of cost recovery can clearly depend on whether one is talking about financial or economic values. Note already the use of values as opposed to prices. This is because economic pricing can often be about seeking "shadow prices "- values that are not reflected in market prices.

It is important to start a discussion about cost recovery by looking at costs from an economic perspective – the costs to society of the project or programme. This discussion includes the consideration of the true economic value of water. This then provides the context for the financial costs of a WATSAN project or programme – the financial costs to the uses and/or the lenders.

To do so, one needs to firstly look at water as an economic good.

2.3 *RECOVERING THE ECONOMIC VALUE OF WATER*

The Dublin Declaration is a useful starting point for a discussion of water as an economic good.

> *"Water has an economic value in all its competing uses and should be recognized as an economic good. Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water led to wasteful and damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resource".*

To paraphrase, whatever we do with water has a value. If we drink it then it has a value and, were we asked to express our willingness to pay this value, all of us might express some positive amount. Similarly, were the water used to irrigate crops then its value can be inferred as part of the output value of the same crops. But water is scarce and there is competition between uses such as human consumption and agriculture. In general, society does best by allocating water to its highest value uses.

Note again, the use of the term value. The term may seem somewhat subjective and normative. However, if the sum total of value "created" is important in decisions to allocate resources to water then this value in competing uses must be identified and, as far as possible, measured. It is important to point out that value does not necessarily equate to price, and that the value of many water uses may be difficult to detect or substantiate with reference to existing markets or what households can spend on water. Instead, value might be considered as something that goes beyond the household's immediate income. It can encompass intangibles, such as those deriving from things such as security, reliability, through to spiritual belief and traditional rights. This point will become important when we try to assign values to water resources. The discussion of water valuation leads to the distinction between willingness to pay and ability to pay.

An economic value must also imply a net value - a value of the use of consumption (a benefit) minus the (wider) cost of supply. The Dublin Declaration implies that water is rarely costless to access or supply. This means that the cost of supply must be assessed in order to derive fully the highest net value uses on offer. This consideration takes us a step nearer to an economic interpretation of cost recovery. As well as different financial costs of supply, some uses may have higher environmental costs than others, and some of the wider benefits of supply may have higher value than others (human health, for example). If these economic costs and benefits are taken into account, in addition to financial costs, then the use of subsidised water for agriculture, for example, may not look so attractive relative to using water for drinking water supplies.

On the other hand, however, were water allocated to domestic use over agricultural use, and were the agricultural value of water higher than domestic willingness to pay, we would say that each unit allocated to domestic use incurs an opportunity cost. That is, the loss in value incurred as a result of allocating the last unit to one use rather than another. Opportunity cost ultimately dictates whether a society allocated its water to its highest value uses. However, the implementation of opportunity cost pricing is difficult in practice. It is useful, only to mention it in the context of national resource allocation.

Thus, the full value of water as an economic good is built up by a consideration of financial costs, environmental costs, social costs and opportunity costs. By advocating an economic good approach the Dublin Declaration sets a general "first best" principle for how water should be allocated in society. In essence the point is that allocating water to the highest net value uses, is a way to maximise net social welfare from water use. Moving towards an economic approach to valuing water and water pricing based on these economic values is one way to attempt to maximise social welfare. This holds whether we are undertaking cost-benefit analysis of water projects and attempting to value the benefits, or simply setting economically efficient tariffs[2].

This discussion on economic cost recovery is very much a society wide objective that abstracts from the individual project, which in most cases will be struggling with more limited but more immediately relevant financial cost recovery. For many non-economists this focus on an abstract concept of aggregate welfare is simply a distraction that complicates a delivery agenda. However, the distinction is worth highlighting as a theoretical benchmark.

A number of points arise from this simplified introduction of water as an economic good.

[2] Note that these objectives are related. A technically correct economic appraisal of a water scheme will use economic values for the main output (water). A financial appraisal for a village scheme on the other hand may be based on a tariff that does not necessarily have to relate to the correct economic price.

- The concept of water as an economic good is admittedly rather abstract in the sense of focussing on an outcome that is socially optimal yet consistent with welfare declining for some members of society. As a simple example, economic prices for water may equate to higher tariffs than some can afford. Accordingly, the Declaration makes reference to the need to address a rights based approach to access. It is important to note that this does not mean that an economic good and rights based approach are mutually exclusive. Rather, ways must be found that reconcile this first best approach (applying economic pricing) with providing access to others at an affordable price. Enacting a rights based approach to water is therefore likely to require some form of cross subsidy, or access to grants.

- Water does not always have a monetary price and, if it does, the prevailing price is not the same as its economic value. The absence of value information aggravates the process of assessing the return to competing uses and, by extension, to improving our understanding of the economic viability of water schemes. Much energy has therefore gone into the estimation of water value using willingness to pay methods. This agenda has dovetailed conveniently with a related approach to water supply planning that emphasizes the need to measure demand and for WATSAN interventions to be demand responsive.

- The multiple components of economic value, which must be represented in an economic cost recovery strategy for water resources, such as financial sustainability, social equity, governance and environmental sustainability must also be balanced with each other in reality. There are trade offs. The balance must also be set in the context of the debate about the most effective forms of ownership for service delivery (i.e. the public private mix) and the fact that WATSAN user charges and tariffs are perhaps the only form of instrument to address these competing objectives.

- The task therefore is to consider the steps necessary to move towards both the value of water supply (for appraisal) and the correct pricing of water for charging consistent with its status as an economic good. This requires us to consider the costs of supplying water including methods to assess the value of water in competing uses. Once we have seen how the costs of supplying water can be added up, we are then in a position to consider the likelihood of cost recovery of some or all of the costs and the payment mechanisms and devices that help to optimise recovery. Note that while accurate economic pricing represents what economists call a theoretical first best, pricing in practice is likely to be an approximation.

2.4 *RECOVERING THE FINANCIAL COST OF WATER*

The Dublin declaration is couched largely in economic terms. But in its simplest (engineering) terms cost recovery can be equated with financial sustainability. Water supply is not free and WATSAN projects that raise

revenue from users to cover operation and maintenance costs are likely to be financially autonomous in the short run. WATSAN projects that can derive a suitable rate of return or surplus from their assets, however, are likely to be financially sustainable in the longer term. Put simply, a water project will not be financially viable if costs are not recovered somehow at least to operate and maintain capital.

It is the question of *supply* costs that requires further clarification in order to provide a benchmark of successful financial cost recovery. Although the term "full cost recovery" is widely employed, the difficulties in estimating some economic values mean that financial supply costs (usually operation and maintenance costs) are the more realistic cost recovery targets for most WATSAN schemes worldwide.

So how much of the past, current and future financial supply costs should be recovered? As the following list makes clear, there are several levels of recovery that can be targets for project viability. The extent of costs incurred by the WATSAN initiative, and therefore to be recovered depends largely on whether

- The project is new or an incremental expansion.
- The project is forward looking, in terms of factoring in up-front payments to cover eventual capacity expansion.
- The nature of the source of original financing – is there a loan, which needs repaying as well?

In regard to the latter, the distinction between private or public (including voluntary) stakeholder involvements will also determine expectations about the rate of return that must be earned on investment outlays[3].

It is helpful to benchmark cost categories while noting that much of the cost recovery debate assumes a level of accountancy understanding that may be beyond some communities or local WATSAN implementers.

Categories of WATSAN charges, from which financial costs could be recovered would include:

- A zero cost tariff: free un-metered water subsidised through other means with ad hoc recovery.

- Tariffs set on assumed ability to pay (affordability) or some other socio-economic factor or rule of thumb. Again, this may be unrelated to the actual cost of supplying the water - it is often used in rights based or a supply-driven approach.

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[3]This is commonly defined as the investor's cost of capital; the rate of return they must seek in order to exceed the notional interest rates payable in turn to their own creditors.

- An increase in some existing arbitrary tariff modestly in line with inflation.

- Part or full recovery of operation and maintenance costs.

- Operation and maintenance costs plus infrastructure and connection charges.

- Operation and maintenance costs plus the depreciation costs of the assets: this can be seen as a 'replacement fund' or performance fund to finance future capital investment.

- Operation and maintenance costs, plus full amortisation of past investments (i.e. capital costs plus interest on loans plus depreciation) - these are also termed current costs.

- A target rate of return on the fixed assets (ROFA): this is a means of charging based on historical costs.

- Average incremental costing: charging based on the forward-looking requirements for replacement and incremental upgrading (a proxy for a long run marginal cost).

- A long run marginal cost that include the consideration of environmental and opportunity costs.

Note that the concept of the long run marginal cost (or its short hand approximation of Average Incremental Cost) sets the tariff decision in the context of the whole project life. This means that the calculation has to undertake some form of time discounting so that current prices can account for future costs. Factoring the future into current payment decisions is quite difficult to conceptualise.[4]

Of course, supply costs will vary with the multiplicity of technical options, which in turn will depend on the size of the community to be served. Cost recovery can be defined to various levels of sophistication.

Project experience currently suggests that maximizing the coverage of operation and maintenance costs and some replacement costs is the primary objective of public sector type agencies involved in rural WATSAN service delivery. Very few projects begin to recoup initial infrastructure costs or charge for anticipated expansion arrangements.

[4] Calculation of the Long Run Marginal Cost is controversial in water economics. The measure is often substituted by a more convenient approximation know as the Average Incremental Cost. This defines the unit cost of water service $/m3 = NPV of annual costs to implement project /change in quantity water consumption due to project (m3). NPV is the Net Present Value.

Once the categories of financial (and economic) costs that could be recovered are understood, the questions become

- What level of cost recovery should a project aim for?
- How can projects be designed to maximise cost recovery?
- How can a project's cost recovery be improved?

To provide answers to these questions, the issue of *demand* has to be understood and explored.

2.5 *UNDERSTANDING DEMAND*

The evaluation of supply costs presupposes a range of WATSAN options that meet a community's current and future supply requirements. To arrive at these options the service authority will have to

- Identify an unmet need.
- Forecast approximate demand or capacity based on population and consumption patterns.
- Present the technical options to potential consumers - including costs
- Estimate a range of tariff scenarios that relate to possible solutions for delivering the estimated quantity of water.
- Present the technical options to potential consumers - including costs and tariff implications.
- Estimate or elicit household willingness or ability to pay for favoured options.
- Revisit and/or redesign options in the light of cost, willingness to pay or other preference disparities.

The last two of these stages constitute our understanding of what has come to be known as the demand responsive approach. The approach contrasts with traditional supply focussed approaches to WATSAN, which, having found some technical solutions, have simply implemented a project.

2.5.1 *Supply side approaches*

Numerous examples demonstrate the reality of failing WATSAN services where communities have not maintained or replaced water systems, implemented in a supply-orientated manner. This may be because some projects were over-designed for the target population and were simply too

expensive to maintain. Or, in some cases failure may be due to a local culture of non-payment, possibly exacerbated by the refusal to accept an inappropriate technology. The problem of supply infrastructure not matching the preferences of the host community has been a common conclusion on the shortcomings of the supply side approach to WATSAN in the past.

In the last decade or so, however, the engineering literature has recognised the limitations in a supply-orientated approach to WATSAN services, and has emphasized the role of more appropriate technology. More recently still, there has been an emphasis on matching technology characteristics with community preferences for supply. "Assessing demand" has then consisted of undertaking more sympathetic interactions with the user community to explain the technical options on offer and which they may prefer.

However, these approaches and their supporting literature are still rather poor in their understanding of the importance of demand in the wider project appraisal process. In other words, they have tended to de-emphasise the link between project design (meaning more than simply the technical solutions on offer) and user preferences. Since the mid 1990's, however, this discrepancy has been addressed by the demand responsive approach (DRA).

2.5.2 *Demand responsive approaches*

As previously mentioned, it is the mismatch between community preferences and the one-size fits all engineering solutions that has characterized the disillusionment with what has been termed a supply side approach. While reliable supply may have been the engineering objective (using a technologically appropriate solution) failure to undertake a comprehensive evaluation of community preferences has often resulted in inappropriate solutions. This in turn leads to low use, buy in, and inevitably compromises cost recovery as households opt out of the new supply and revert to their previous supply options. It follows then that improved cost recovery may have its roots in an earlier stage of preference elicitation.

The more recent emphasis on DRA suggests the need to match supply options more closely with consumer preferences, including preferences not only about the specific technology, but also about its management and how much and how to pay. DRA is important, since in many ways it actually precedes the consideration of costs in the sense that costs will largely be driven by the supply option that most closely meets user preferences.

A central theme is that the process is likely to be iterative in the way options are presented and modified between host communities and service authorities. This process is also likely to take into account a wider number of options and characteristics about the project than just technology, including, the supply type payment schedule, water volume allowances, the price and local management and institutional arrangements.

The importance of the price here is in informing the financial viability question and the chances of cost recovery early in the design and project cycle process. Note that, however, elicitation of household willingness to pay provides guidance as to the overall welfare[5] derived from the project and all its component parts, and by extension the likely tariff that can be set.

Importantly, it is taken for granted that the service provider has made an accurate estimate of the capacity and future water demand and that the amounts used in a contingent valuation survey match the requisite costs. In other words one is not looking to elicit a value or willingness to pay for an inappropriately sized scheme that imposes a disproportionate cost burden, as a result of a poor water demand forecast. Demand forecasting is therefore an important stage of the DRA process.

While DRA has become something of a mantra there is still some disagreement about how to undertake a truly demand responsive assessment. This is because the iterative process is often compromised by either participatory constraints, a shortage of alternative technologies, or an operating framework that restricts local differences in management or payment schedules. For this reason, writers refer to *degrees* of demand responsiveness when discussing the extent to which a project is demand-driven. The primary measure of the degree of demand-responsiveness is

"the degree to which consumers have choices over their level of service with the idea being that consumer preferences, including willingness to pay, should determine the level of service (LOS) to be provided and charges set accordingly to recover actual costs (Garn, 1998)

Perhaps the least understood element of the process is the measurement of demand or willingness to pay, which are equivalent in *economic* terms. The interpretation of demand in WATSAN discussion is often confused, as is the discussion of methods to elicit demand.

2.5.3 *Interpreting demand*

A fundamental element of the demand responsive approach is in understanding demand itself and unlocking some of the commitment and value that households place on appropriate methods of service delivery. This means tailoring the characteristics of supply options to user preferences. These characteristics can cover technology, quality etc, but important elements also include how to pay, how much to pay and how payment is collected. Interestingly the question of how payment is collected includes the issue of who collects and the perceived end use of collected revenues. Thus preferences are as much related to the acceptability of the prevailing institutional arrangements for water service provision, as they are to the technical option on offer.

[5] In economics jargon this measure of stated welfare provides the total value of a resource including consumer surplus

The economic concept of demand lends much to the understanding of what has come to be termed DRA in WATSAN circles. While demand has a very specific interpretation by economists, it is clear the DRA is not universally built on this interpretation[6].

As previously mentioned demand in economic terms is equivalent to willingness to pay (WTP), which is equivalent to economic value. Note that these are not the same as price, another measure that typically gets set relative to supply costs.

If one can observe a downward sloping demand curve (relating WTP and quantity) for a good, then at once there is some understanding of the magnitudes of value associated with larger quantities of the good. Accurate demand information allows an understanding of how much of something to supply and allows price to be determined[7]. Thus, the supply can be got just right if one knows what the demand is. Equally, in a fully functioning market, an efficient supply will be forthcoming if costs are fully recovered - ie if people face the economically correct price[8] for the good.

Hence, supplying too much of something relative to demand, or supplying a commodity that has different attributes to the ones demanded, are both inefficient uses of resources. This issue lies at the heart of the problem with a supply driven approach to WATSAN services.

However, a DRA to WATSAN service design, as currently practiced, does not adhere rigidly to the economic interpretation of demand described above. There are good reasons for this, the main one being the technological constraints as to which WATSAN interventions can be offered. The perfect demand and supply scenario assumes a fluid world of perfectly divisible units that are independently demanded by, and supplied to, individuals who respond to market signals. But, WATSAN interventions tend to be lumpy and the demanding communities tend to be heterogeneous in their range of income sources and other socio-economic characteristics. This means that matching supply with demand is a real challenge for WATSAN practitioners, who have historically adopted a supply orientated, or "one size fits all" approach (almost the other extremity of a spectrum to a truly demand responsive approach). Cost recovery potential is then compromised.

As things currently stand, WASTAN practitioners are attempting to move away from this approach by introducing some demand responsive elements to the project design process (for example by designing a number of technical options for the community to select from). The process of outlining, discussing

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[6] *As an example of the "alternative" interpretations of demand, see Parry-Jones (1999) which shows an engineering interpretation of demand that is, in fact, very close to a definition of supply.*

[7] Price can be set somewhere between the cost of supply and the WTP.

[8] A price that fully represents the scarcity value, or opportunity cost, of the good

and selecting one of these options with communities, can be termed, broadly, as taking a demand responsive approach. Concerns can be raised about the affordability or suitability of technologies to local conditions, and cost recovery rates still appear to hover, at best, around the operation and maintenance level. There are many WATSAN projects like this, and they are mostly discussed as involving DRA to a lesser or greater degree (depending on the number of focus groups held, the amount of options offered etc). It could be argued, however, that few of these initiatives still actually tackle the price/quantity balance properly.

It may not be possible to approximate a truly demand responsive world of fluid options for WATSAN. However, the research challenge is to move WATSAN project planning in the right direction for its consumers who, studies show, *are* WTP for water, with less concern about its price or their income than may be thought. Again, their WTP reflects *preferences that are as much related to the acceptability of the prevailing institutional arrangements for water service provision, as they are to the technical option on offer.*

The challenge remains: how can just the right balance of a WATSAN product and its price be found to design the right intervention?

In the context of demand assessment for WATSAN, the price/ product relationship for an intervention cannot always be observed. The location of the demand curve for each and every potential intervention cannot be exactly known. Instead, the relevant clues to an interventions' value have to be elicited by asking communities to reveal their preferences for it. One has to design for demand properly, however, by combining ranges of scheme attributes (quantity, institutional arrangements, payment schedules etc) *and* prices, to encourage maximum buy-in by a target community. This is quite different from asking consumers to select (or value) one of a given range of WATSAN technical options.

Injecting the economic interpretation of demand into DRA for new WATSAN schemes or upgrades, amounts effectively to the design of a "new good" that the community either accepts or rejects. This is essentially a marketing approach to new product design. Rejection of a scheme is not tantamount to saying that the technology is not appropriate. Instead, it should be taken as a signal that more information on one or more attributes (nature of supply, price, tariff structure etc), needs to be elicited from the target community in order to get the design bundle right.

It is well known that peoples' WTP can vary, depending on, for example, the nature of the question asked, or the bid vehicle that is used in the survey about paying for WATSAN services. Indeed, some have highlighted this variance as a sign of weakness in stated preference studies, and as support for reverting to more "robust" indicators of affordability, such as the "5%" rule.

However, it can be suggested that a consumer's WTP response for a particular supply option (ie would you pay X for this?/ how much can you afford to pay

for WATSAN services like this?/ do you prefer this one or this one and how much would you pay?) seeks to elicit only their perceived affordability of the option, or just an expression of their WTP. By not discussing the price/product balance explicitly, the approach focuses on the immediacy of cash in the household to pay for/ to afford the discrete service offered.[9]

Yet many studies have shown that in rural /peri-urban areas, the marginal utility of money is high (people value hard cash highly), that incomes tend to be low or insecure, and that often people pursue a wide range of livelihoods whereby their wealth is tied up in a number of assets, and not just in disposable income. This complexity of livelihoods means that households frequently have diverse strategies for accessing income to satisfy basic needs and that observed affordability (how would you spend the cash you have) does not provide a good indication of preferences over appropriate service delivery.

Further, many studies have also shown that water is an inelastic good in relation to income or price (ie demand - or WTP- for water doesn't really change significantly in relation to its price or people's income) and that innovative ways of paying for water such as through savings groups, revolving funds etc can be useful - the way the payment vehicle is designed can also influence how much people will pay (see section 3 to this report).

These studies seem to be contradictory. Rural /peri urban people are poor and value their cash greatly. They have to pursue many strategies to survive. And yet they will still pay a lot for water in relation to their income, or will be influenced to pay by project designs, which may be contrary to what an affordability study may have suggested.

2.5.4 *Notional and effective demand*

A key area of the demand literature, which may help explain this contradiction, is an identification of a difference between notional and effective demand. Sen (1981) illustrates effective demand by considering a shop selling food in a famine area, where many people cannot afford to buy the food. The need for food is great, but only a few people can buy it, therefore, effective demand for food is small. Pearce (1981) defines effective demand as the *"aggregate demand for goods and services which is backed up with the resources to pay for them.....distinguished from 'notional demand' which refers to a desire for goods and services"*

Credit or other financial assistance and the type of payment structure on offer in a WATSAN product, can help to translate a person's notional into effective demand, rendering affordability or rule of thumb analyses less useful. These

[9] The analogue may be to ask someone in the UK how much they would be willing to pay per month for their child's education at a specified, good quality, fee paying school. I can't afford it even though I would like to, may well be the common response, unless you offer me some form of savings scheme or other specific credit facility to help pay for it. Anyhow, the preference may not be for that particular school, but instead for another (and even then boarding for some, day school for others etc etc).

differences may be of central importance to the WATSAN debate on financial sustainability.

For example, a large part of the literature (especially within Government policies) has therefore focused on the fact that poor people cannot or should not pay for WATSAN services. However, many studies have also shown that poor people do in fact, often pay a high price to access WATSAN services, just to cope. A range of other studies have also suggested poor people are willing to pay for improved WATSAN services. And there are also many examples of rights-based WATSAN projects, which have found that innovative ways of paying for water such as through savings groups, revolving funds etc can be useful - the way the payments are designed can also influence how much people will pay.

Hence in theory, the effective WTP of the consumer can be fixed, but if they have access to other assets (labour, livestock, credit, savings schemes) and if the overall design of the WATSAN "product" particularly suits them, then their notional demand may be quite high. If the right mechanism can be designed and implemented to translate their notional into effective demand for WATSAN services therefore, and it is part of the WATSAN product on offer, then they may be willing and able to pay beyond their observed and immediate income constraint.

Is this what successful, demand focused WATSAN projects and programmes have done to deliver financial sustainability? They iteratively design a WATSAN product that can help to transform a recipient communities' notional demand for improved services, into an effective, paying demand, which recovers the costs of the intervention.

2.6 *CONCLUSION*

There is an important distinction between economic and financial interpretations of costs and how to recover them. While most WATSAN practitioners focus on financial cost, it is important in terms of allocative efficiency across society and the environment, that economic costs (or values) are not lost in the appraisal process.

The economic approach considers water as a valuable asset that households are prepared to purchase. It emphasizes the role of willingness to pay as a measure of the value of water and relates these to supply costs. Economic thinking and the concept of opportunity cost can be evoked to explain why cost recovery is necessary even if a rights-based stance to supply and entitlements is adopted. In this case the cost of free water allocations are simply met by diverting resources from some other economically productive use. These other foregone uses of government resources may have procured greater economic benefits for society.

More common, is to consider the financial costs of WATSAN projects or programmes and how to recover them. A gradation of the financial costs that

can be recovered by a WATSAN project or programme can be devised. Most current initiatives recover only a few of these financial costs, and hence most WATSAN projects are not financially, let alone economically, sustainable.

To make WATSAN projects and programmes more financially sustainable, it is useful to design them around what people want and therefore what they are willing to pay for. This is broadly known as taking a demand responsive approach to WATSAN services. However, many WATSAN professionals have interpreted this approach by offering potential users a range of technical, more low cost (affordable) options from which to choose.

In fact, a demand responsive approach and the willingness to pay estimates it derives from potential users, sits more closely with economic than financial assessments of costs. Within a WTP bid, respondents will value not only the technical option on offer, but also the institutional arrangements, the suggested pricing schedule and other attributes of the product. Finding a way to match a cost-recovering tariff to a WATSAN "product" is something that demand responsive approaches can help with, by taking an iterative approach, a bit like designing a new product for the market. The technology may stay the same (constrained by logistical or engineering limits), but ways and frequencies of paying, collecting fees, managing, owning or using the product may vary, causing people's WTP to change, depending on their preference.

Further, by developing a financial mechanism within the product design process, whereby notional demands (what I would like) can be translated into effective demands (what I can afford) for WATSAN, the notional demand within a poor community for improved services, can be translated into an effective, and paying, demand, which can recover the costs of the intervention. In this manner, by understanding demand and working with it properly, the problem of undersupply, affordability and financial sustainability could all be addressed.

3 COST RECOVERY - WHAT SEEMS TO BE IMPORTANT?

3.1 INTRODUCTION

This section summarises our findings from an exploration of what seems to be important in relation to implementing practical cost recovery strategies for rural and peri-urban WATSAN projects. It draws on a range of evidence from our research investigations, conducted over the duration of this project. These included:

- A literature review of the demand assessment and cost recovery debate in WATSAN.
- A survey sent to WATSAN agencies, practitioners (NGOs, the private sector) and IFIs, asking about their thoughts and experiences on demand assessment and cost recovery
- A meta-analysis of previous WTP papers on WATSAN
- Field study findings from WATSAN programme and project visits to both South Africa and India

Annexes containing details on each of these investigations can be found at the back of this position report.

3.2 THE KEY POINTS

From across the range of our research investigations, the main recurring findings are as follows.

3.2.1 *On the definition of cost recovery*

There is considerable variation in the understanding of what cost recovery actually entails. Most practitioners view it in financial terms. A commonly held definition exists across many projects in India, whereby cost recovery is seen as equating to X% of capital and 100% of operation and maintenance costs being paid for by users. In South Africa, however, for many operators and WATSAN professionals, cost recovery is equated with payment rates - i.e. the percentage of billed households that actually paid. Clearly, this definition provides little information about the efficiency of the tariff in force.

Most practitioners and policy makers don't equate a cost recovery objective I WATSAN service delivery to either the issue of financial sustainability, in the long run, or to economic issues, such as opportunity or environmental costs.

3.2.2 *On Demand*

- Household income, though important, is not the overriding determinant of demand for improved WATSAN services. Poorer people see water as a relatively income inelastic good and are willing to pay for it, especially in

drier areas. The way they are asked to pay for it, however, affects how much they are willing to pay.

- The demand responsive approach was an importance conceptual step developed by the World Bank, which helped move the debate on WATSAN in poor communities, away from a supply focus and toward a demand orientated approach.

- There is now a broad consensus on the usefulness of measuring peoples' demand for WATSAN projects, and the sorts of options on offer to do so. However, there seems to be little agreement on exactly when to implement a demand assessment; or how to use its findings to help design financially sustainable projects.

- Understanding the difference between notional and effective demand may help to show how, by improving the use of demand assessment, more sustainable WATSAN projects and programmes could be designed.

- At the moment, less accurate, but more feasible methods for assessing demand, such as focus groups, take prevalence in the field, over more intensive approaches such as participatory rural appraisal or contingent valuation studies. Affordability studies tend to dominate the demand assessment domain.

- The use of credit or other methods of financial assistance and the type of payment structure on offer are also important variables that influence demand. They can help poor people to "buy into" a WATSAN project and pay for it.

3.2.3 *On Credit and Subsidies*

- Cross-subsidisation policies can fail to provide incentives to the service provider to bill or collect from many poor users, thus aggravating cash flow and financial sustainability problems. Social tariffs may also create disincentives for urban providers to expand their services to low-income areas, and are difficult to implement in non-networked rural areas. For example, social tariff blocks such as the South African "Free Water' Policy" are extremely difficult to reconcile with first-best cost recovery principles.

- The use of long run cost pricing for water plus a cash subsidy or a form of credit given to the user, could be an alternative to subsidising water tariffs in peri-urban area. It could also be a way of helping to pay back a loan for a WATSAN connection or investment.

- Field evidence suggests that sustainable financing strategies for WATSAN projects often require the inclusion of a source of finance to pay for improved levels of services and operation and maintenance. Credit can bind people to repayment and can lead to growth and sustainability of the system.

3.2.4 *On Charges and tariffs*

- Designing and charging for a WATSAN scheme on the basis of the 3-5% affordability rule of thumb is misleading, though in practice many practitioners use it.

- For connections, findings suggest that the poor should pay for their connection charge, either via a flat rate fee or a fee that relates to their income.

- For recurrent supply costs, communal standpipe users should be charged a tariff linked to the operation and maintenance of a basic level of service and individual connections be charged the average incremental cost of the operation and maintenance, depreciation and capital cost of supply.

- An efficient tariff policy should be one that reflects the marginal economic costs of supply.

- In practice, users are most often charged in relation to the volume of water that they use. Lifeline tariffs for the lowest income households and increasing block tariffs were the most popular charging structures. Free blocks in the tariff are the least popular.

- For cost recovery, public sector agencies (bilateral agencies and NGOs) tend to aim for operation & maintenance plus replacement costs. Private sector agencies (development banks, IFIs, the private sector) tend to aim for operation and maintenance costs plus replacement, interest, capital costs, and costs of future expansion. The public sector aims reflect a desire to meet basic needs, ensure an equitable use of the subsidy and to break even. The private sector aims reflect a desire to obtain an operating surplus or a return on the assets. The private sector aims are financially sustainable; the public sector aims are not.

3.2.5 *On Governance, institutions and the private sector*

- In practice the most prevalent obstacle to achieving cost recovery was said to be political interference, inappropriate public policy or a lack of political willingness to institute cost recovery mechanisms.

- (Local) Governments and their WATSAN agencies must make the transition from being a 'provider' of services to becoming a 'facilitator'.

- Often the only sustainable manner of managing rural water supply and sanitation is for a community management model to take charge. However, this can be difficult in cases where the legal and regulatory frameworks cannot formalise the status of such organisations

- Peoples' willingness to pay for investment costs has been found to increase dramatically when communities, rather than government agencies, have control over how funds are spent.

- The most viable private sector participation options for rural and peri-urban communities are local. They are seen as the following:
    - *Community based organisations.*
    - *Small-scale contractors and local suppliers. .*

- Local level NGOs can play a critical facilitation role.

- One solution is to formalise the relationships between these small-scale private sector suppliers and a larger WATSAN supplier is in the form of locally established partnerships. Sector reforms in South Africa demonstrate a range of permutations for such management arrangements.

- Taking an "output-based" approach can help the local supplier to deliver. It can provide clearer thinking about the use of any subsidy on offer; perhaps directing funds to the one-time costs of service connection, rather than the ongoing costs of consumption. This may be particularly pertinent to how donor agencies implement their projects, especially as small-scale local entrepreneurs, community groups, or local NGOs, could be these local suppliers. Small scale, output-based WATSAN projects have been successful in India.

3.2.6 *What works*

- Practitioners suggest the following are key to maximising the chances of financial sustainability:-
    - Small scale, local projects.
    - The use of participatory assessment and focus groups to assess demand.
    - People-based systems of fund collection, management, utilisation and maintenance.
    - Transparency and a high level of public awareness and availability of relevant information.
    - Availability of flexible payment systems and supporting finance

- The projects that are financially sustainable (and therefore cost recovering) seem to have tapped into people's notional demands then found ways to make the project derive a return from its assets that allows it to finance itself. They tend to be locally run, easily replicable, but dependant on a wider decentralisation policy within which to work. They have mostly benefited from a "seedcorn" grant and parallel financing mechanisms. The poverty of their participants does not seem to have been a constraint to their success. Unfriendly wider policy environments have.

- In India large donor led projects with a project management unit at state level, a budget of US$ tens of millions and an NGO implementing agency to assist, seem to be less financially sustainable than smaller, more locally

focused community run WATSAN projects, with budgets of US$ hundreds or thousands.

- The larger projects aim for ballparks of 10-15% capital cost payments from users, with upfront cash contributions varying from 1% to 10%; 100% operation and maintenance cost recovery; and about 60% cost sharing for individual latrines. The smaller projects achieve cost recovery rates of 50 - 100% capital costs, 100% operation and maintenance, replacement costs and operate their local networks at a surplus, using extra funds for wider investments. Both are working with the poor.
- The larger projects tend to follow a financial framework for implementation, which doesn't necessarily change at the local level. Some beneficiary groups could pay more towards the capital cost of the schemes than the 15% they are currently asked for. Other user groups do not necessarily easily or willingly replicate the project without another grant arriving to help them, given the low level of beneficiary contribution required to start with.
- The smaller projects, however, tend to look for organic replication following a first "seedcorn" investment. They use and support local suppliers, and develop local rules. A local body becomes a facilitator. The local owners tend to use the asset to generate a surplus (like the private sector) and use local employment to run it. These projects have tended to develop out of crisis, or in spite of the wider WATSAN policy environment. Parallel financing mechanisms and support networks also seem to be important.
- A much more decentralised and community-focused model of implementation, especially since constitutional amendments in the early 1990's has created the policy framework within which these smaller projects can take place.

- In post Apartheid South Africa, low levels of cost recovery in the WATSAN sector have occurred for political and historic reasons, especially in poorer township or rural areas. As a result, most practitioners think that cost recovery levels equate to the returns on WATSAN bills sent out, rather than the pricing policy at work.

- The changing institutional and regulatory landscape for WATSAN delivery in South Africa, including the decentralisation process, together with the expanding role for private sector investment in an increasingly liberalised WATSAN sector are consistent with the achievement of cost recovery targets and long term financial sustainability. However, the New Free Water Policy has created a great challenge to the implementation of cost recovery as a key part of this reform process. The Government and Water Service Agencies are therefore left with the dilemma of having to work round the free water commitment, and this is creating a general exercise in widespread cross-subsidisation.

- Nevertheless, the new model structures for WATSAN service delivery in South Africa at work in some locations may yet give rise to innovative contracting and collection mechanism, particularly in cases where community-based organisations are taking the role of service providers and where they have financial autonomy (as opposed to simply paying revenues to the municipal service authority).

- Other NGOs in South Africa such as the Mvula Trust, claim that many stand alone rural WATSAN projects do exist (kick-started through an NGO facilitation process), with local level community management and good rates of cost recovery. Interestingly, it seems that these projects will probably not avail themselves of the free water policy, as the NGOs who coordinate them believe that it is not consistent with their schemes working.

3.3 *THE LITERATURE REVIEW*

3.3.1 *Introduction*

A literature review was undertaken at project start, October 1999. This concentrated on two areas:

- A review of papers, reports, overviews and conference proceedings about demand assessment, willingness to pay and cost recovery, focusing particularly on the debate about whether or not to use demand responsive approaches (DRA), and the application of the "water as an economic good" concept to WATSAN projects and programmes. Much of the WATSAN literature of the mid 1990's was taken up with these kinds of debate.

- A review of work since the mid 1990's, particularly from the Work Bank, on issues relating to investments in infrastructure services, regulatory polices, private sector participation and their combined effect on the poor, especially in peri-urban and rural areas. These sorts of financing, investment and regulatory policy (management model) themes are now often at the forefront of the WATSAN debate.

There has also been a review of some of the output and follow up to the World Water Summit in the Hague, September 2000, which heralded the beginning of a return to a discussion about social entitlements and subsidy in the WATSAN provision debate. Other issues, such as water supply within a livelihoods context, and the emergence of the concept of output-based aid, and its relevance to WATSAN delivery in rural areas, have also emerged during the research period.

Each of these issues is reflected in the literature review, which can be found in Annex B to this report. It should be stressed, however, that we do not consider our literature review to be comprehensive or the last word, but simply to be

viewed as a useful text that highlights the main directions where the literature suggests the cost recovery debate in WATSAN projects should be heading.

Key issues drawn from our literature review are as follows.

3.3.2 *The Challenge of Cost Recovery*

Four core issues emerged from the range of interpretations on cost recovery we looked at.

- Costs are usually recovered from the users, ie the poor.
- At least operation, maintenance and replacement costs should be recovered in order for the project to be financially sustainable, but ideally part-payment of capital costs should take place too. One off subsidies are tolerable.
- Local institutions, policies and a people-focus are as important as the level of charge in order to achieve cost recovery in a WATSAN project.
- Some form of user focused demand assessment and financial support framework can help in the setting and repayment of the service charge.

3.3.3 *DRA*

In terms of assessing demand, "DRA", has been a key concept. The term first appeared subsequent to the Dublin Declarations, in 1998, in a World Bank note entitled "Managing Water as an Economic Good".

In this note, the concept of a Demand Responsive approach (DRA) was put forward. DRA was an approach to WATSAN that attempted to respond to consumer demands and which aimed at making projects more sustainable than supply-driven approaches. The following were listed as key characteristics of DRA:

- Community members make informed choices about:
    - Whether to participate in the project;
    - Levels of service, based on willingness to pay;
    - When and how their services are delivered; and
    - Financial management and management of O & M;
- Governments play a facilitative role;
- An environment enabling private (and NGO) participation is created
- An adequate flow of information is provided to the community.

Another important aspect of the DRA approach was the suggestion that communities compete for funds for WATSAN projects, in order to help the agency decide whether to provide support to a particular community and what type of system and level of service to provide. This was a controversial idea.

The research conducted by The World Bank between 1987 and 1990 was used to back up the DRA model.[10] This study found that household income, though often important, was not the overriding determinant of demand for improved WATSAN services. The following three factors (in no order of importance) were found to be significant:

- Socio-economic characteristics: household income, gender, education, occupation and assets, among other local demographic characteristics;
- Characteristics of supply: the relative merits of the proposed water supply (over the existing source), particularly relating to cost, quantity, quality and reliability; and
- Households attitudes towards government policy in the sector and towards other organisational representatives with whom local citizens deal.

For many NGOs, however, the DRA debate was fundamentally flawed - how could poor communities compete and pay for WATSAN projects? The DRA model also became, in their eyes, contiguous with the problems of the contingent valuation survey - how could you realistically ask a poor community what they would be willing to pay for a WATSAN project? - and with the Dublin Declarations about water as an economic good in general.

Partly as a result of some of these problems with the DRA model, there was a shift away from the DRA agenda in the statements from The Hague, toward a more rights based approach for WATSAN delivery.

3.3.4 *Demand for WATSAN services*

A log linear functional form is often assumed for the demand curve for water. This implies that the price elasticity of demand for water is a constant at all levels of water use within households. Although this is at best a crude representation of household water demand behaviour, it allows economists to provide a reasonable approximation of people's actual demand behaviour. This is an important assumption, but it may be a misleading oversimplification, as many other studies indicate that income, though important, is not the overriding determinant of demand for WATSAN services.

[10] Demand for Water in Rural Areas: Determinants and Policy Implications. Briscoe et al, World Bank Research Observer, January 1993.

Another important issues from the literature is the identification of a difference between notional and effective demand. Understanding this difference helps to throw light on the DRA debate, and may help to show how improving the understanding and use on demand assessments may help to design more sustainable WATSAN projects and programmes.

Sen (1981) in his seminal publication *Poverty and Famine: An Essay on Entitlement and Deprivation*, (International Labour Organisation, Oxford University Press, New Delhi, India) illustrates effective demand by considering a shop selling food in a famine area, where many people cannot afford to buy the food. The need for food is great, but only a few people can buy it, therefore, effective demand for food is small. Pearce (1981) in the *MacMillan Dictionary of Modern Economics*, (MacMillan Press, London, UK), defines effective demand as the *"aggregate demand for goods and services which is backed up with the resources to pay for them.....distinguished from 'notional demand' which refers to a desire for goods and services"*

Hence, if a demand assessment can be used to find out about both peoples' notional demands for WATSAN (hypothetically, what sort of WATSAN services would you like?), and also how they would like to translate their notional into effective demand (and how would you best like to pay for them?), then a key obstacle to the use of DRA is resolved (notwithstanding the issue of competition for funds).

The use of credit or other methods of financial assistance and the type of payment structure on offer can help to translate notional into effective demand, rendering affordability analyses less useful. The constraint of cash becomes less of a problem, if parallel to identifying (notional) demands, structures for the preferred financing mechanisms that allow these demands to be realised, are also discussed.

Understanding these differences between notional and effective demand may be of central importance to the WATSAN debate on financial sustainability.

3.3.5 *Measuring demand*

There is a range of ways of measuring demand. DFID's 1998 Guidelines on Water and Sanitation Projects are broadly representative of the range, and suggest the following:

- Participatory Rapid Appraisal (PRA) facilitated by community members (for low cost, low-tech options).
- PRA facilitated by a trained researcher (suitable for most technologies and can be complemented with other approaches)
- Revealed preference approaches (suitable where substantial water problems exist, in conjunction with PRA models).

- Contingent valuation studies (for informal strategic decisions on level of service; cost recovery policy and large investment programmes).

- The 'Benefits transfer' approach, under which results in one location are used to estimate benefits in a 'similar' location is *not* recommended.

Although there is a broad consensus of the usefulness of measuring peoples demand for WATSAN projects, and the sorts of options of offer to do so, there seems to be little agreement on

- How and where in the project cycle demand assessment techniques should be used.

- How to implement a demand focused policy in practice, so as to design financially sustainable projects, in a cost-effective manner.

The key issues that determine whether demand assessment leads to sustainable financial projects, seem to broadly consist of the following

- Tackling affordability and associated income generation issues, as well as identifying demand;

- The methodology used to elicit willingness to pay values and the translation of demand assessment information into design and tariff decisions;

- Demand variances within the community; and

- The financial management capacity of the community.

3.3.6 *Affordability*

A range of references suggests that the 3-5% rule of thumb is misleading. For example, the World Bank, the UNDP- World Bank Water an Sanitation Programme, the Asian Development Bank and DFID recognise that the assumption that people would be willing to pay 3 to 5 per cent of their income on water is arbitrary. They generally recommend that affordability studies be are put more in the context of how consumers currently cope and what they actually pay for water.

In general, the literature shows that willingness to pay (WTP) has proven to be a more successful indicator of demand than ability to pay. Some studies have shown higher WTP for poorer households, compared to a standard of around 2 to 3% spent on water services among high-income households. These results indicate that rural communities may prefer service levels above the minimum often prescribed and that rural or peri-urban water and sanitation projects may not actually require extensive government subsidies.

DFID's 1998 WATSAN Guidance Manual is slightly contradictory in relation to its encouragement, on the one hand, to assess demand and its approach, on the other, to affordability. Although the manual agrees that affordability "rules of thumb" have been shown to be a poor guide to WTP for WATSAN service improvements, the guidelines do suggest that affordability should be interpreted on a case-by-case basis. Hence, the identification of notional demand for WATSAN services is potentially subsumed by the recommendation to explore cheaper, more affordable (and therefore supply orientated) options for the community.

Designing an appropriate incentive compatible form of credit scheme seems to be instrumental in stimulating disadvantaged groups to initiate income generation activities and to enhance their group solidarity. Some practitioners in the water and sanitation sector believe that sustainable financing strategies for WATSAN projects actually require the complementary development of micro-credit and savings mechanisms to build a source of financing to pay for improved levels of services and operation and maintenance - that the financing issue should be considered in the wider context of poverty eradication, for both sanitation and water services. These practitioners feel that credit binds people to repayment and leads to growth and sustainability of the system.

This seems to be a centrally important point that potentially links the issue of capturing notional demand to the design of a reasonable standard of WATSAN service supply that can become financially sustainable.

DFID's position on this area is relatively weak however. The 1998 Guidance Manual suggests that demand assessment studies can help in the design of payment mechanisms that are appropriate for poor people. They can identify, for example, people's preferences for weekly as against monthly payments, or for credit arrangements to spread over time the capital casts of connection fees. However, it doesn't make explicit the link between design a WATSAN project and designing a complementary financing mechanism alongside.

3.3.7 *Costs and charging structures*

The literature agrees that an efficient tariff policy should be one that reflects the marginal economic costs of supply. Since most water is consumed by a relatively small number of consumer groups (large residential, commercial and industrial users) a marginal cost based price for all consumption other than required for basic health purposes would generally be an efficient, equitable and financially viable policy.

In order to satisfy equity and financial objectives, it is generally recommended that communal standpipe users be charged a tariff linked to the operation and maintenance of a basic level of service (also considering affordability) and individual connections be charged the average incremental cost of the operation and maintenance, depreciation and capital cost of supply.

The literature agrees, however, that tariffs can also be used as instruments of social policy, such as for the redistribution of income based on equity concerns. A commonly observed approach is to use a tariff schedule that consists of a low subsidised "lifeline" rate for the first 6-8 m^3 used per month, and a higher rate for all additional consumption. The lifeline rationale underlies the Free Water Policy introduced in South Africa. However, it is important to understand how such policies can compromise cost recovery when the 'free' block is at or near the average household use for smaller schemes.

Where metering is possible, the literature seems to concur that a two-part tariff is an improvement on increasing block tariffs as it can achieve the intended income distribution element required and eliminate the within-block regressivity of an increasing block tariff. The first part is a capacity charge that determines a user's maximum usage during periods of excess demand plus any other fixed costs The second part is a usage price equal to marginal cost. The two-part tariff confronts most households with the full marginal cost of supply.

3.3.8 *Subsidies*

In peri-urban areas, the review found that cross-subsidisation policies can fail to provide incentives to the service provider to bill or collect from many poor users, thus aggravating cash flow problems. In fact, social tariffs may create disincentives for these providers to expand their services to low-income areas. Unrealistically high rates to industrial and commercial users can force them to look for alternative supplies, thus reducing market share and, in the process, exacerbating the cross subsidy problem.

Alternatives to subsidising water tariffs in peri urban areas, therefore, could be the use of marginal cost pricing for water plus a cash subsidy for the poorest, which is unrelated to water use, or a form of credit given to the user, to help pay back a loan for a WATSAN connection or investment. It is usually preferable to subsidise access to a service rather than consumption

DFID's approach to subsidies for water supply schemes is that they should be justified on income redistribution grounds, and not on direct health benefits. DFID suggests that subsidies for sanitation may be needed to correct for 'market failures', which arise because inherent demand does not lead to the level of investment in those sanitation services which would be most efficient for the economy and society.

3.3.9 *Decentralisation and regulation*

Policy, legal and regulatory frameworks that mandate and support both the decentralisation of, and increased participation in, WATSAN service delivery by the private sector and community groups, are seen to be vital for the success of financially sustainable projects.

There is an increasing realisation that governments must make the transition from being a 'provider' of services to becoming a 'facilitator'. National agencies should be responsible for finance, long term planning, standard setting and technical assistance. Private sector participation can assist in the provision of demand driven services, but specific attention should be given to the needs of demand driven services for poor people from the outset of contract and regulatory framework design. If this does not happen, then there is a risk that the resulting regime actually creates further barriers to the provision of such services.

For rural areas, many water sector studies recommend that the only sustainable manner of managing water supply and sanitation is for community management models to manage their own water and sanitation supply systems. However, this can be difficult in cases where the legal and regulatory frameworks have not formalised the status of such organisations. This can create very practical difficulties for such organisations, especially if they are tasked with collection of tariffs and financing of maintenance, without a clear legal entity allowing them, for example, to open a bank account.

The particular management model adopted for water and sanitation projects seems to impact significantly on the level of demand. Communities may distrust a national government's capacity to manage the operation and maintenance of water and sanitation projects efficiently, and consequently their demand for such projects decreases. Willingness to pay for investment costs has been found to increase dramatically when communities, rather than government agencies, have control over how funds are spent. Here again, however, community cohesion around a community-based service authority requires a degree of transparency in relation to funds management. Distrust and non-compliance with otherwise successful projects can be minimised by the addition of training support to community managers.

The review found that the main types of support needed by communities to help sustain their own WATSAN project management services are:

- Legal and institutional frameworks that recognise community water management groups and provide a clear division of responsibilities;
- Training to develop community capacity for operation, maintenance and financial management;
- A strong system for the provision of technical backup.

The literature is generally agreed that public utilities do not have the financial or political autonomy to set tariffs at levels that recover costs. Private sector participation in WATSAN projects and programmes is therefore seen as the most efficient way of ensuring financially sustainable pricing policies.

Current research on how regulatory and legal frameworks can be formed so that large-scale private providers of water and sanitation services can effectively deliver water services to the poor, whilst ensuring that the sector's financial viability is assured, points to the following key issues:-

- The needs of the poor should be central to any private sector reform process.

- The assumption that poor customers are high risk, low return customers should be challenged, which may require a significant information gathering exercise.

- The problems of informal settlements should be directly addressed.

- Innovative ways to address technical problems should be actively encouraged.

- The distance between the provider and poor customers should be reduced

Many commentators feel that small-scale private sector (or currently informal) inputs can play a role in resolving some of these issues. If these operators are responding to expressed and identified demand, then in doing so, cost recovery will be *de facto*. For example, recent studies suggest that entrepreneurs in water and sanitation, responding to local conditions and competing for market niches, can offer a wide and flexible range of water supply options - residential re-sales, for example.

In general, the most viable private sector participation options for rural and peri-urban communities are seen as the following:

- *Community contractors.* They can help foster community empowerment and ownership of the project, but do require social development and technical support.

- *Small scale contractors and suppliers.* These agents can help which develop private enterprise in the water sector.

- *Water and sanitation related NGOS.* These organisations can provide social development assistance and the small-scale management contracting of systems. With decentralisation of service authority, the former role is likely to be more important than the latter.

However, it may be difficult to combine the short time scales within which the private sector operator may be required to work, with the longer time-scales that demand led approaches take. One solution is to formalise the relationships between these small-scale suppliers and the main supplier in the form of partnership, a solution that *the World Bank Business Partners for Development* has been investigating. In practice, partnerships have shown to offer significant potential, but a range of problems are still to be resolved if

such partnerships are to meet their potential. Instead, locally established partnerships might offer alternatives.

3.3.10 *Output-based aid*

In relation to the better use of local partners in financially sustainable WATSAN service delivery, a recent approach called "output-based aid" maybe helpful. Output based aid seeks delegate service delivery to a third party (such as a private company or non-governmental organization) under contracts that link the payment of public (or donor) funds to the outputs or results actually delivered to target beneficiaries. This approach is intended to provide a sharper focus on objectives, improve incentives for efficiency and innovation, enhance accountability for the use of public resources, and create opportunities for mobilizing private financing.

It is suggested that output based aid approaches can provide clearer thinking about the use of the subsidy, perhaps directing the funds to the one-time costs of service connection – typically the main impediment to expanded access to services – rather than the ongoing costs of consumption. This may be particularly pertinent to WATSAN service delivery, cost recovery, and how donor agencies implement their projects, especially as small-scale local entrepreneurs, community groups, or local NGOs, could be important suppliers.

3.3.11 *Livelihoods approach*

A livelihoods approach towards looking at WATSAN investments can help to show how water and sanitation projects can be seen as key assets which if created or strengthened can help to move people out of poverty, rather than as simply being an end in themselves.

Water and sanitation interventions can be viewed strategically (as income generators, money savers, livestock waterers, land investments, dwelling/ lifestyle improvements etc); as things that can add value to people's livelihoods, help to alleviate poverty and facilitate longer term planning.

By encouraging payments in kind towards their development and payments for the coverage into the future of their recurrent costs, and through a sympathetic participatory design process (which may include the building of an extended household or group network for management), the investment can become part of people's (and communities) asset base, and therefore one that they will seek to sustain and use themselves to their best advantage.

WATSAN investments can thus be seen as a turning point, or a catalyst to improving poor people's livelihoods. This framework may help to understand how best to design financially sustainable WATSAN projects especially for the chronically poor.

3.4 THE COST RECOVERY SURVEY

A cost recovery survey was designed by this project[11]. Water Aid and DFID helped to review it. The survey was emailed during August- October 2000 to 722 actors in the water and sanitation sector globally, and also disseminated via several WATSAN e-discussion groups.

At its core, the survey attempted to identify:

- What WATSAN organisations understood by the term cost recovery; and demand assessment
- What WATSAN organisations were doing about cost recovery in rural and peri-urban areas, and what seemed to work?

Over 100 responses were received as well as accompanying notes and papers. 55 survey forms were completed in enough numeric detail to be inputted to a database, allowing a comparative analysis to take place.

The survey grouped its respondents into:

- Private sector companies/consultancies;
- Non-Governmental Organisations (NGOs);
- Development agencies;
- Development Banks/ IFIs; and
- Research/ academic bodies.

Out of the 100 or so replies, more private sector organisations responded to the survey than any other group - indicating perhaps a demand for knowledge among these actors.

A detailed analysis of the responses is presented in Annex C to this report. The key findings of the survey are presented below.

3.4.1 *Who works with the poor?*

The Development Agencies and NGOs who replied were more involved in WATSAN projects with households in rural /peri-urban areas at the bottom of the income range (*less than US$200 pp pa)* when compared with those replies from Development Banks and the Private Sector. This perhaps indicates evidence for the "cherry picking" tendency, whereby private finance in WATSAN tends towards the lower risk urban consumer.

Also of interest was the fact that Development Agencies tended to incorporate WATSAN as part of a wider, or more integrated, development project more so than the NGOs, Development Banks and the Private Sector who replied.

[11] *A copy of the survey is presented in Annex C.*

3.4.2 *Assessing Affordability*

Nearly a third of those who responded (across all types of group) still use the 3-5% rule of thumb for assessing affordability, commonly stating that as an *initial* tool it can be useful (the rule of thumb indicating that a household can afford a WATAN service if it costs between 3 and 5% of their income).

Other methods for measuring affordability suggested in the survey responses included:

- PRA techniques including wealth ranking and community self-assessments of individual's ability to pay;
- WTP surveys (Contingent Valuation questionnaires);
- Community financial surveys;
- Use of past experience in other villages
- Cost of current coping strategies; and
- Use of wealth indicators such as transport and purchasing habits.

It seems that assumptions about levels affordability may still be quite prevalent in the field, before any demand assessment takes place and this could affect what are seen as the realistic design parameters for WATSAN options.

3.4.3 *Measuring Demand*

Most respondents saw demand assessment techniques, of one form or another, as a useful tool in helping to achieve financial sustainability in a WATSAN project. However, while a number of the survey respondents explicitly stated that it is essential to assess demand prior to the start of a project, 73% of the respondents stated that they determine people's preferences for different levels of service *at some stage* during the project, ie once the project has been designed, or technical options have been selected.

Hence, understandings about what "assessing demand" really means are probably still quite broad ranging. Comments from respondents when asked what they understood from the term demand assessment reflect this (*Annex C*).

The survey found that, from respondents' experiences of demand assessments, the three most important factors for project viability and financial sustainability were:

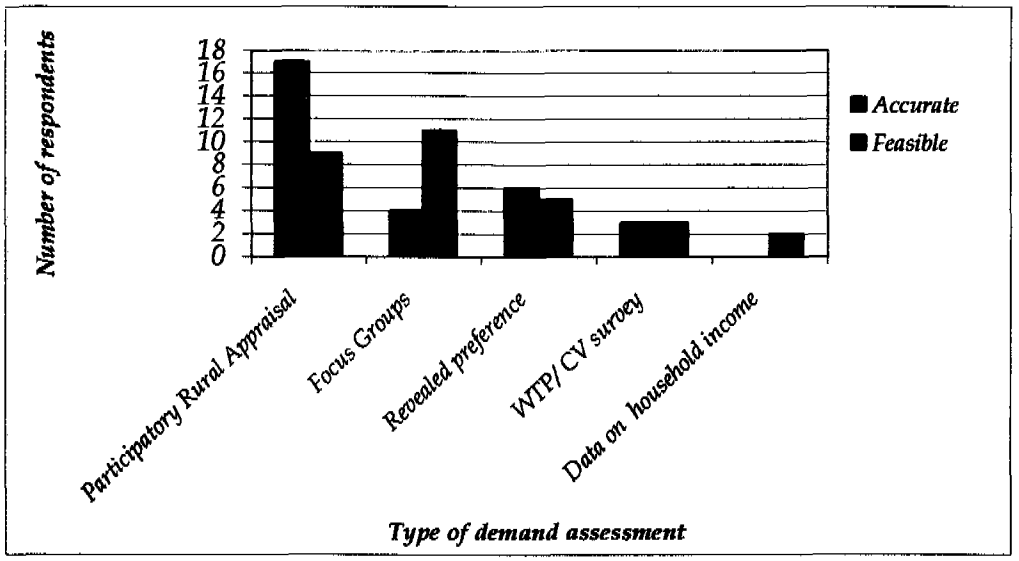
- An interest and demand from the consumers;
- Meeting the consumer's needs; and
- The affordability of the service.

It is interesting to note that, to design a project that actually works, practitioners suggested that the need to find an interest from, and meet the

(notional) demand of, the consumer for the service, sits above concerns about affordability.

The preferred demand assessment techniques used by respondents, in terms of accuracy and feasibility, are shown below.

Figure 3.2 ***Most preferred demand assessment techniques in terms of accuracy and feasibility***



It seems that less accurate, but more feasible methods for assessing demand, such as focus groups, take prevalence in the field. More technical or resource intensive types of demand assessment studies such as Contingent Valuation are used less often. Responses to the use of PRA were interesting. Though it is considered accurate by many respondents, its feasibility, though strong, is less than that of focus groups. Again, perhaps time and resource constraints are an issue here.

3.4.4 *Costs and charging structures*

Costs

The NGOs and Donor Agencies, who responded, tended to consider WATSAN projects to be financially sustainable if they recover operation & maintenance plus replacement costs. Development Banks/IFIs and the private sector however, felt that financial sustainability occurred if the operation and maintenance costs plus replacement, interest, capital costs, and costs of future expansion are covered. The difference in outlook on this issue between the NGOs and Development Agencies (public sector), and the Private Sector and Development Banks/ IFIs (private sector) that replied was quite noticeable. These differences may occur for the following reasons.

For the public sector (NGO/ development agency), the financial objective for a WATSAN project is often to:

- Meet basic needs as stipulated in their own or recipient government policies;
- Make an equitable use of subsidies;
- Break-even, i.e., the revenue generated by the project equals the cost of supply (in the short run).

For private companies, their remit is to:

- Generate a profit or surplus;
- Ensure a return on fixed assets.

Capital cost recovery was less prevalent, but some private sector organisations and NGOs who replied also included the recovery of capital costs, in their definition of cost recovery, and said they used this to judge the financial sustainability of a project (through a measure of recipient "buy in").

However, it was clear that few WATSAN actors outside of the private sector saw the recouping of long run costs as the only yardstick of cost recovery, Inherent in most thinking was the necessity of subsidy at some point.

Charges

Respondents felt that people should pay for their water connections, even poor people in rural areas. Free connections to water services were not considered to be the best form of sustainable water and sanitation provision. In fact, 42% of respondents felt that users should pay equal amounts for their water connections, while 37% considered a connection charge, which reflected the user's level of income, was more appropriate.

For both water and sanitation provision, once the connection charge is established, the majority of organisations who replied believed that users should be charged in relation to the volume of water that they use. Lifeline tariffs for the lowest income households and increasing block tariffs were considered to be the most useful charging structures. Free blocks in the tariff were the least popular option.

The development agencies, private sector companies and NGOs who responded felt that these tariffs should reflect *some* of the financial costs of supply. The development banks tended to feel that prices should reflect the long run marginal costs of supply.

3.4.5 *Obstacles to Cost recovery*

Although many organisations that replied have the intention to make their WATSAN projects financially sustainable through adequate cost recovery (according to their particular definition of cost recovery), there are often

factors that were said to complicate this process. The most prevalent of these tend to be political factors, such as inappropriate public policy or a lack of political willingness to institute cost recovery mechanisms. For sanitation, failure of other agencies to recover costs, are also important*Table 3.1* ranks the complications to cost recovery which respondents chose.

Table 3.1 ***Complications to Cost Recovery in WATSAN Projects (Ranked In order of the issues most often stated by organisations working on WATSAN projects.)***

	Water		Sanitation
1	Political Interference	1	Political Interference
2	Low/ Variable Incomes	2	Insufficient Willingness to Pay
3	Distrust of Cost Collection System	3	Low/ Variable Incomes
4	Insufficient Willingness to Pay	4	Lack of Management Transparency
5	Lack of Management Transparency	5	Distrust of Cost Collection Systems
6	Inappropriate Project Design	6	Failure of Other Agencies to Cost Recover
7	Failure of Other Agencies to Recover Cost	7	Inappropriate Project Design
8	Expense of Project	8	Cultural/ Religious Reasons
9	Social Exclusion Issues	9	Social Exclusion Issues
10	Land Tenure Issues	10	Land Tenure Issues
11	Cultural/ Religious Issues	11	Expense of Project
12	Flux of Population Size	12	Flux of Population Size

It is interesting to note that political interference ranked top of the replies in both instances, above low income or unwillingness to pay. Furthermore, this is exactly the same finding about obstacles to cost recovery as identified by another review - the Business Partners For Development review of cost recovery in their Partnership projects in the water cluster (K Komives and L Stalker-Prokopy (2000) *Cost Recovery in the Focus Projects: Results, Attitudes, Lessons and Strategies.* Business Partners for Development Research and Surveys Series.)

3.4.6 What works

Finally, WATSAN practitioners were asked simply what tended to work best to ensure cost recovery and financial sustainability among poor WATSAN users. The most common answers tended to follow the following themes:

- Small scale, local projects.
- The use of participatory assessment and focus groups to assess demand
- People-based systems of fund collection, management, utilisation and maintenance.
- Transparency and a high level of public awareness and availability of relevant information.
- Availability of flexible payment systems.

3.5 THE META ANALYSIS

Using *Meta analysis*[12], twenty-five published studies on water and sanitation supply were reviewed as part of the research project, most of which were contingent valuation studies.

The main purpose of the meta-analysis was to assess the relevance of different variables in determining demand for water services; a secondary purpose was to evaluate the potential of meta-analysis as a research tool to inform policy-making and water project planning through the use of benefit transfer.

A more detailed account of the findings is given in *Annex D* to this report, but the main findings are presented below.

3.5.1 *On the Relationship between WTP and Key Variables*

In analysing the key determinants of Willingness to Pay (WTP), income was considered first. A positive but poor relationship was found between aggregate income and WTP for water. This supports the notion that:

Water is a relatively inelastic good

- If income is treated as the sole determinant of willingness to pay, for every 1 percent increase in income, WTP increases by 0.5 percent.

Hence, WTP for water is relatively high even at low levels of income

- At low income levels, people pay to meet basic needs and will pay relatively high amounts for this: The meta analysis found that someone with a zero income will pay US$0.5 (or go into debt) for each extra unit of consumption or level of satisfaction associated with an improved quality of water.

Water demand becomes more elastic as income increases and the use of water extends beyond that required for 'basic needs'

- High-level income groups may be using water for less essential purposes, and consumption above their level deemed 'adequate' for a reasonable standard of living is therefore more likely to be more sensitive to price.

The above suggests that the '5-percent rule' may be inappropriate

- Analysis shows that aggregate income levels are widely dispersed. In particular, it shows that the distribution of income is often highly skewed towards a minority of high-income earners. Therefore, it may be inappropriate

(12) Meta analysis is a means of providing a statistical review of existing studies. It permits a systematic investigation of the magnitude and direction that selected variables across a range of studies may have on demand. A function was derived in order to find a generic model that can explain the relationship between WTP and key variables and that can assess the likely WTP levels needed for cost recovery.

to base cost-recovery factors on general assumptions about what people can afford to pay.

However, while income is an important factor in determining households' effective demand for water services, the meta-analysis indicated that it is not the sole determinant of demand. Rather, it was found that willingness to pay is a function of several variables that reflect the socio-economic, demographic and physical environmental characteristics of households that may vary according to season and location.

The most significant factor influencing WTP is the location of the study site

- Households in urban areas have a higher WTP than those in rural areas.

The second most significant variable explaining WTP is climate

- Households in arid climates may be willing to pay more for their water supplies because of the greater amount of time needed to collect water. Or it may be that households in low rainfall regions will already have invested large amounts of money in storage tanks and may have evolved sophisticated coping strategies and may therefore be unwilling to allocate more income towards piped services

The type of charging system is an important determinant of the median WTP for connection

- Those asked to pay upfront are willing to pay less. This may be explained by limited liquidity and a high marginal utility attached to the cash they do have.

- Households are prepared to pay more for a flat rate than volumetric rate. This may be because they do not understand how the volumetric system works or if they are opposed to paying the additional capital costs associated with the installation of an effective metering and charging system.

3.5.2 *Implications*

From the findings of the meta-analysis, it may be inferred that:

Poorer people see water as a relatively income inelastic good and are willing to pay more for it, especially in drier areas. The way they are asked to pay for it, also affects how much they are willing to pay.

Given the importance of variables other than income, there is a also a need for local investigations and understandings of what people can actually afford to pay for their water services and what determines their willingness to pay, in WATSAN project design. Affordability rules of thumb are not accurate and could be misleading.

As it is impracticable to conduct detailed micro-level surveys for the purposes of evaluating the costs and benefits of every WATSAN project or programme, there could be a strong argument for the development of methods such as this, that allow for the transferability of research findings within key regions.

3.6 THE FIELD TRIP TO INDIA

3.6.1 Introduction

Cost Recovery and financial sustainability in WATSAN projects in India are important to DFID. Working with key partner states, DFID's budget for water and sanitation in India for 2001/02 was planned to be about US$17 million. As well as increasing its expenditure, DFID's aim is also to make these investments in water and sanitation more effective and more demand-led.

In November 2001 as part of this KAR project, ERM met with key WATSAN stakeholders in India to discuss the research themes of the project and the issue of cost recovery in water and sanitation projects, more generally, in India. A wide range of stakeholders was met, from both a policy and project perspective. These included representatives from the World Bank Water and Sanitation Programme, South Asia, DFID India and Water Aid India, as well as community representatives from projects in Kerela and Tamil Nadu.

Project visits were also made to DFID, World Bank, Water Aid and community run projects in Andhra Pradesh, Kerela and Tamil Nadu.

Annex E to this report provides a more detailed visit report.

General Background to WATSAN Cost recovery in India

There is a long and complex policy history to rural water supply and sanitation in India, and an attempt has been made to summarise the key policy and institutional issues in *Annex E*. In short, there has been a (arguably unsuccessful) history of State level provision of WATSAN services since independence, backed up with extra Federal funding for rural areas since the 1970's. This is now giving way now to a much more decentralised and community-focused model of implementation, especially since constitutional amendments in the early 1990's created the policy framework within which decentralisation could take place. Cost recovery, partly of capital costs and mostly of operation and maintenance costs, now plays a significant part in this decentralisation process. The private sector, however, is less prevalent as a service deliverer, especially in rural areas.

The UNDP/ World Bank Water and Sanitation Programme (WSP) South Asia have usefully encapsulated the payment and cost recovery debate on WATSAN in India, which remains problematic.

The WSP suggest that, politically, water supply has remained a state responsibility since independence and that political promises on state supplied WATSAN centre on the following four conceptual points:

- The poor cannot afford safe water and sanitation and should not have to pay for it.
- Public subsidies are provided to help the poor pay for water and sanitation.
- The Government of India can solve the problem of water supply by running water and sanitation programmes itself.
- The Government of India can raise the financial resources needed for water supply and sanitation.

However, the WSP suggest that the reality is more akin to the following:

- The poor in India actually do pay for water supply and sanitation, often far more than their fare share.
- The subsidies for water supply and sanitation benefit mainly those who are not poor.
- Public provision on water supply is inefficient and ineffective.
- The investment requirements for water supply and sanitation in India are far too great for the Government of India to afford.

Hence the situation in India is of great pertinence to this research study, both in terms of the size of the problem and because the key issues identified by the WSP in India reflect some of the findings of this study, namely:

- It may be important to think less about absolute incomes (whether people can afford water supply and sanitation services or not) and more about designing convenient ways of helping people to pay for the water supply and sanitation services they want.

- The key issue that seems to makes cost recovery of WATSAN investments less straightforward was found to be *political interference.* Below are summaries of the six case study projects examined.

i. The World Bank Swajal Project, Utttar Pradesh.

The Swajal Rural Water Supply and Sanitation Project is a US$63 million project covering about 1,200 villages in 19 districts in the Hill and Bundelkhand regions of Uttar Pradesh. Central to the project's design have been two major polices:

- Partial capital cost recovery (10%, with upfront cash contributions varying from 1% to 5%); 100% operation and maintenance cost recovery from user communities; and about 60% cost sharing for individual latrines.

- The creation of an alternative service delivery mechanism for rural water supply and sanitation, involving a partnership between the village water and sanitation committee, NGOs and a Project Management Unit (PMU).

The Swajal project has undoubtedly been very influential in India's rural water supply sector. The cost recovery objectives it set are now part of key recommendations for India's national water supply policy.

ii. Village Level Water Supply Schemes in Olevanna, Kerela.

Olevanna is a Gram Panchayat (GP) with twenty wards located on the eastern side of Calicut,North Kerela. The GP covers 21.5 km^2, with a total population of about 50,000 people or 10,100 households (as of 1998).

Since 1987, and resulting from a crisis situation of both drought and a lack of State funding, a network of privately run water supply schemes in Olevanna has been established. Between 1987 and 1995, 26 privately registered schemes arose across the Olevanna GP. In general, each household put in between 4,500-12,000 rupees for the capital costs of the scheme and then paid 5-10 rupees per month for operation and maintenance costs.

The GP played a facilitatory and regulatory role in this process, rather than acting as a supplier. It also provided a review and audit procedure for each co-operative's accounts, and it developed some rules of supply - limiting supply to 400 litres a day and encouraging water meter installation to ensure these limits were adhered to, or that extra costs for the additional supply (20 rupees per 1,000 litres) were paid.

The official state water supplier - the Kerela Water Authority (KWA) - was not helpful in the early days, as the schemes challenged their remit. However, since the decentralisation process for water supply and sanitation began in earnest in Kerela in 1995, the KWA have been much more supportive.

Since 1995 a further 34 schemes have been created in Olevanna (which means a total of about 10,000 households now benefit from these private schemes), but the approach has changed slightly. Now, the GP can provide 50% of the capital cost of the scheme and uses this, if required, to help with payments, for instance if the households cannot pay the full 100% of capital costs. User charges have increased to 30-40 rupees per month, due to increased electricity costs for pumping. Many schemes are now operating at a surplus.

Of the participating households, it was estimated that 25% were below the urban poverty line of 22,000 rupees per annum (Olevanna can be counted as a peri-urban rather than rural GP). The start up costs to join the scheme could represent 3-4% of household income (and in some cases up to 20%). To help the poorest with the repayment process and monthly charges, monies are collected "little and often" (a rupee a day) for those who prefer.

However, there have been some problems. Due to the level of water extraction on the GP, issues of water resource management (and encouraging perhaps water harvesting as a substitute to pumping) are now important - price signals are seen by the GP as the best way to do this. Also, the GP admits that support in developing its pricing policy to cover long run costs would have been extremely useful.

Nevertheless, the Olevanna schemes show that full cost recovery can be achieved in peri-urban areas (with reasonable levels of poverty) for water supply systems. People did pay the full cost, relying on little external help. Furthermore, these schemes have included effective metering and volumetric-based charges and, importantly, have involved an institution that used to be responsible for supplying water, re-emerging as an effective facilitator and regulator of the system. Importantly too, the official water supply agency was not a supporter of the system until a policy change toward decentralisation took place, which legitimised the existence of the schemes in the state water supply providers eyes.

iii. The Kerela Rural Water Supply and Environmental Sanitation Project (KRWESP)

The KRWSESP is a US$80 million project, supported by an IBRD loan of US$60 million, with the balance financed by beneficiaries (US$8 million), the GP's (US$6.5 million) and the Government of Kerela (US$5.5 million). The project will provide WSS in four districts in Kerela. About 80 GPs from these four districts, out of a potential 358 have been identified for project implementation. A limit of 30,000,000 rupees per GP is set. Within each GP, there will be about 25 beneficiary groups. The project emerged partly after a World Bank representative had visited the Olevanna Schemes.

IBRD loan funds are passed on from the State Water Authority to District level PMUs. Funds from the DPMU, the GP and the beneficiaries then flow into the same bank account, to support each scheme within the district. The KRWSESP is expected to directly benefit about 1.5 million people or 5% of the state population. On average, capital costs for water supply are 6930 rupees per household and annual operation and maintenance costs are 180 rupees per household. In cost recovery terms, the aim is that 15% of the capital cost of each scheme is to be paid by the beneficiaries (of which at least 7.5% of payment must be in cash). The beneficiaries should meet 100% of the schemes operation and maintenance costs.

Kunnummel Panchayat is one GP implementing the KRWSESP. It has 10 Wards and a total population of 17,365, or 3,868 households, of which 35% are below the rural poverty line of 18,000 rupees per household pa. The project is covering 970 out of the 3868 households in the GP. There are 27 beneficiary groups in total, with about 36 households per group.

For the water supply component, the project will aim for 70 litres pp pd, 8 hours pumping pd, with a 4 hour am and a 4 hour pm slot to pump water. For the environmental sanitation programme, low cost latrines are envisaged for

those households below the poverty line only, and these households are expected to meet additional costs over and above the 2,000 rupees provided by the Project.

As per the project design, the Kunnummel Panchayat will contribute 10% of the capital costs of the project, the beneficiary's will contribute 15% (7.5% in cash and up to 7.5% in kind) and the remainder will come via the GoK (5%) and the DPMU for the project (70%). NASRAD, a local NGO is the support organisation for the project within this District and will help the DPMU to provide community facilitation and participation expertise.

The project is proceeding well, although the DPMU thinks beneficiary groups could pay a lot more towards the capital cost of the schemes than the 15% they are currently asked for. Also, the project is not necessarily easily replicable by other user groups, without another loan to the DPMU, given the low level of beneficiary contribution required. The payback of the loan for the project by the GOK is another issue that may question the replicability of the project.

iv. The Andhra Pradesh Urban Services for the Poor Project (APUSP)

The State Government of Andhra Pradesh, is working in partnership with the Department for International Development (DFID) to assist poor communities in 32 towns of Andhra Pradesh. The towns the project focuses on are between 100,000 and 1 million in population and hence have a reasonably degree of peri-urban, or slum, related issues to tackle, especially in relation to water and sanitation services.

Project assistance by DFID is £94.4 million. The entire assistance is a grant to the Government of Andhra Pradesh. About 71% of the assistance from DFID will be in the form of financial aid for services, and 29% is Technical Assistance such as training for councillors, officials, civil society organisations and communities. APUSP comprises of three main components - municipal reform, improvements to environmental services (including water supply and sanitation) and work with community-based organisations. To administer the project, two new units have been established in the State Government

In relation to WATSAN, the project's main focus for cost recovery is on collecting people's dues on water supply tariffs, rather than on working to design and set a more appropriate level of the tariff. This is because there is a feeling that people can only pay up to 3% of their income on a water/ wastewater tariff; and that bigger gains can be made on reducing the supply costs of water/ wastewater services (especially in relation to energy) than on trying to increase charges, which the Government is reluctant to do.

The project adopts a process-based approach and so did not have any fixed ideas about reasonable levels of cost recovery to aim for at the outset. Instead, the aim has been to make the Municipalities more aware of the recurrent costs of their WATSAN services and how best to both reduce the O&M costs and fund these services sustainably. With regards to O&M charges, the project

follows state tariffs for water supply, which were only 30-40 rupees per month, but have been increased to 60. The project would like to see them increased to 70. At present, slum dwellers are obliged to pay only 50% of the tariff.

v. The Urban Slums Health and Sanitation Improvement Programme, Tiruchirappalli, Tamil Nadu.

This project involved the Tiruchirappalli Corporation, the Tiruchirappalli District Administration, Water Aid India and three local NGOs as implementing agencies.

Tiruchirappalli City is in the heart of Tamil Nadu, southern India and has a population of 668,000.The city has 155 slum areas containing about 115,000 people. The Municipal Water Corporation had built community latrines in the slums in the mid 1980's, but these latrines fell into in a state of decay and were abandoned by local residents. The key problem was a lack of a sense of ownership over the latrine blocks by local residents.

The NGO Gramalaya sat with local Women's Self Help Groups from within these slum areas and discussed possibilities for sanitation improvements. There was a clear local need for improved sanitation and washing facilities in each neighbourhood and plenty of thought as to how such a facility could be managed. One group came up with the idea of paying to use the toilet - 50 paisa a time, which would include the purchase of cleaning materials and the wages for cleaners, and a watchman cum ticket issuer.

Water Aid provided Gramalya with a grant of 380,000 rupees to build the "pay and use" latrine block and a child friendly toilet block for those less than 6 years old. The charging system was then introduced in one scheme, the first of its kind.

A women's group looks after the upkeep and maintenance of the community toilet block constructed in their slum. Every user is issued a 50 paise token allowing him/ her to use the toilet, from a ticket issuer, employed bythe women's group. A woman from the self-help group collects the money from the ticket issuer and closes the account every 12 hours. The accounts (a ledger) contain details on the number of users and money collected. During nights a watchman cum ticket issuer is appointed.

An average of 300-600 people use the community toilet every 24 hours, totalling 150-300 rupees a day. People prefer to pay their 50 paise and use the "pay and use" toilet blocks because they are reliably secure and clean, compared to other Municipal Corporation blocks or other options available for defecation. The first pay and use latrine has collected 168,500 rupees gross since it began in mid 2000.

The money collected is deposited in a Bank Account each week. At the end of every month the particular Women's self help group from that slum convenes

a meeting and details to members the income and expenditure for a particular community toilet. The balance, after meeting various expenses such as salaries and purchases of cleaning materials is kept in the bank account. It is pooled as a common fund for that particular slum towards health and sanitation related promotional activities including extension of street taps, construction of community halls, renovation of other damaged community toilets, construction of domestic drains, rubbish bins and provision of street lights. As the knowledge of these latrines has spread, loans have been made from the surplus and advice given to other slum communities to help construct their own "pay and use" latrines.

Visitors to the schemes have included state level decision makers and some high level WATSAN officials from elsewhere, such as Chennai. However, without an official policy change at State level, the local Municipal Corporation tasked with providing WATSAN services in the slums won't approve or promote the pay and use system.

In summary, the pay and use latrines are being utilised by very poor slum dwellers and although the first schemes relied on 100% subsidy for the capital cost, the schemes are more than 100% recovering their recurrent costs. The capital cost could be paid back over a number of years. However, the surpluses these schemes have built up as a result, are instead being used to help wider WATSAN developments in the neighbourhood, or as loans to part-pay for other slum self help groups to renovate their systems. As the schemes are starting to self-replicate, less and less grant funding will be required over time. No PMU is involved - a local NGO is the implementing agency. An INGO coordinates the QC of the NGOs delivery. The "seeing is believing" impact of these schemes is strong, both within and beyond the slum communities. However, policy changes are required to allow the State supplier of WATSAN to also "buy into" this approach to service delivery.

vi. Scope/Water Aid Rural Water and Sanitation Programme, Tamil Nadu

Scope is an NGO based in Tamil Nadu, which focuses on the conservation and best use of water supplies. It is a local partner of Water Aid India.

Although SCOPE gets 60% of its funds from the State Government, in terms of WATSAN issue in rural areas, it recognises that NGO's are a "drop in the ocean", but seeks to obtain replication and uptake of its successes from the Tamil Nadu Water Authority. A key achievement of the SCOPE- Water Aid partnership has been to encourage the first village in Tamil Nadu (and possibly in India) to develop 100% sanitation coverage for themselves.

Kar Hikulam village in Tamil Nadu is a typical southern Indian village in a very rural area. It has 110 households, or about 612 people, 90% of who are below the rural poverty line of 18,000 rupees per household per year. SCOPE and Water Aid started work in Kar Hikulam in 1996. They responded to the key demand of the community in Kar Hikulam for improved water supplies, and drilled three new tube-wells in 1996, 1997 and 1999, installing one hand-

pump on each. The community were asked for a cash contribution towards the capital cost of these tube-wells of 10% in each case. Each household was asked to pay 2 rupees per month for O&M. Hence 220 rupees per month were collected (2,640 per year). A surplus was built up (operation and maintenance costs were low - 60 rupees a year - and replacement/ extension costs - a new set of piping - cost 3,900 rupees and have only occurred once).

At the same time as the first tube well, SCOPE also set up self-help and savings groups for women. 25,000 rupees were put into each group by SCOPE to kick start them. Each member paid 25 rupees a month as savings into the group and 2 rupees subscriptions. Then, on a revolving basis, women could draw loans from the fund at a 2% interest rate per month (24% per year).

With regards to latrines, however, the community remained unconvinced at the project start. SCOPE asked the village leaders to put forward households to be involved in the construction of ten "model" toilets. The setting up of the savings groups and the drilling of the tube-well was conditional on this issue. Each volunteer was given a 40% subsidy per toilet to help build the latrine pit safely up to a plinth level (the total cost being up to 1500 rupees to build the whole toilet structure). There was also technical guidance to help build the superstructure, and the possibility of a further loan from SCOPE to help build the structure if needed. The toilets were constructed with a bathroom and attached to a kitchen garden in order to use wastewater productively. Focus groups also discussed health issues with the community and established the high costs (up to 2,000 rupees per year) that people incurred as a result of paying for transport and medicine for those in their family who became sick due to diarrhoea.

Once the first 10 model toilets were built, they became very popular, especially among the women (due to their convenience) and more households requested a latrine. By the end of 1996, SCOPE had helped to build 68 toilets for 96 families. By the end of 1997, every household had built a toilet. SCOPE continued to offer loans of up to 650 rupees to those who could not afford to meet all of their construction contributions. With a 650 loan and a 650 subsidy, only 200 rupees maximum would be required to build the latrine. 39 out of the 110 households took on these loans. The self-help groups also offered further financial assistance.

The income from the kitchen gardens helped to pay back the loan for the toilets, producing on average 30 -90 kilos of fruit and vegetables a year, net of personal consumption, which was sold in local markets for up to 400 rupees in total.

By 1997, 75-80% of the women in the village were using the toilets, and by 1998, 85% of women were and up to 72% of the men were. By 1999 almost everyone was using a toilet. In 1999 a follow up participatory survey found that no single case of diarrhoea had lasted longer than 2 days, and very few people were spending any time or money in the clinics. As a result the saved money was being spent on replacing roof tiles and buying more animals

among other things. By the end of 2001, latrine uptake was also occurring in up to 40 neighbouring villages, with people willing to pay, or take loans, for the full costs of the latrines. Households in other villages had seen the economic benefits the latrines were bringing to their owners in Kar Hikulam.

Importantly, SCOPE has also run sessions in hygiene awareness and education in parallel to the latrine building process. They have installed a latrine mini-mart in a central location, selling all of the spare parts, building materials, soaps and disinfectants that latrine owners need, as well as being a source of advice to new latrine owners. There is also a compound, which displays the range of latrine models a household can choose from. As a result of both the goods it sells and the staff it requires, the shop has provided jobs for local rural people. Furthermore, each village is encouraged to take on and pay for a water and sanitation caretaker, from a scheduled (lower) caste. Although the wage is not significant, the strong role in the community, which this provides for these people, is often of great personal importance.

No PMU is involved - a local NGO is the implementing agency. An INGO coordinates the QC of the NGOs delivery. Also, the "seeing is believing" impact of these schemes is strong, both within and beyond the rural communities. However, policy changes are required to allow the State supplier of WATSAN to also "buy into" this approach to service delivery and to allow the NGO to capacity build the state supplier to take on this kind of role.

3.7 THE FIELD TRIP TO SOUTH AFRICA

3.7.1 *Introduction*

Cost recovery and financial sustainability of WATSAN projects in South Africa are important to DFID. Rather than direct project financing, DFID has chosen to concentrate on supporting capacity building projects, particularly working though the Department for Water Affairs and Forestry to strengthen capacity for managing WATSAN projects at local government level.

This sector wide approach must be considered in the context of the decentralisation efforts carried out in South Africa, which aim at transferring responsibilities for water and sanitation from the Ministry of Water Resources (DWAF) to local governments and particularly, municipal governments. The reforms create an unusually fertile space for testing alternative models of service delivery with new opportunities for partnerships in provision

DFID has indeed adapted its approach to an overall context for WATSAN projects that is substantially different from that in India. South Africa is the richest country in Africa, enjoying considerable wealth from natural resources, even though populations with very different income levels and access to infrastructure services are cohabiting more or less successfully. As a result of this overall level of resources, donors' involvement has been relatively limited

in the water and sanitation sectors, the projects being financed and implemented directly by the central or local administration. This explains why out of the projects visited, and in sharp contrast to the situation described in India, none of the projects were predominantly donor-led with the NGO role being redefined predominantly in terms of training and capacity building

3.7.2 *General Background to cost-recovery for WATSAN in South Africa*

Water and sanitation services have accomplished remarkable progress in South Africa since the end of Apartheid in 1994. The first post-Apartheid government made provision of basic services to disadvantaged people one of its top priorities, particularly in rural areas and former townships. A 1994 White Paper estimated necessary to provide adequate water supply to 12 million people and adequate sanitation to 21 million people. Since then, at least 7 million have benefited from substantially improved water services.

One key element for ensuring long-term sustainability of water and sanitation services was the introduction of radical institutional reforms, which involved devolution of powers to local governments and modification of their boundaries, in an attempt to integrate affluent white areas with black townships and deprived rural areas. Institutional reforms also introduced a clear demarcation between water service authorities (local government) and water service providers. Water service authorities can choose between providing services by themselves or through agreement with other types of operators, including public and private operators, or even NGOs.

3.7.3 *Cost-recovery issues*

Cost recovery raises specific and acute challenges in South Africa:

- Historically, cost-recovery records have been particularly low due to attitudes to paying for water services inherited from the Apartheid era, during which non-payment of infrastructure services was used as an instrument for resistance against the regime - in fact, this is reflected in the common understanding of the term "cost-recovery" in South Africa, which is taken to mean the percentage of bills recovered rather than the percentage of total costs covered through revenues.

- This non-payment culture has recently been reinforced by the adoption of a "free-water policy", whereby the Central Government has committed to providing free water entitlements to all citizens by July 2001.

- The challenges of providing water and sanitation to all are huge, even though considerable investment efforts have been accomplished in the years since the end of Apartheid. These new investments are currently mostly financed through national government subsidies, but this situation does not appear to be sustainable, particularly with economic difficulties looming on the horizon.

Based on these circumstances, South Africa has developed innovative approaches to providing services to poor and marginalized consumers that generate interesting lessons for cost-recovery of WATSAN projects:

- At national level, DWAF has displayed a great capacity for developing new and innovative contractual forms for involving the private sector. In particular, the Build Operate Train and Transfer (BoTT) programme has been efficient for developing water services in rural areas in a speedy and integrated manner, despite its own limitations.

- There has been a big emphasis placed on managing demands in order to minimise costs, particularly through the use of pre-payment metering devices. The incentive for controlling water uses is particularly strong because bulk water is generally sold at cost to retail providers, who then need to cover those costs. Following successful experiences in the electricity sector in South Africa, these technologies have been adopted in a variety of institutional settings. Although they have not been completely successful (particularly due to some technical difficulties), these technologies have been instrumental on focusing the minds on cost-recovery issues.

- Many water sector actors, including development engineers and private sector companies, use community and demand-led approaches as they are very well aware of the high risks of failure of WATSAN projects if local communities are not involved.

3.7.4 *Projects visited*

Given the ability for local governments to contract with various types of operators, ERM selected projects for visit in order to cover a broad spectrum of potential contractual arrangements. Many of these projects are carried out in a peri-urban setting rather than in a purely rural one, because this is where many of the acute problems with cost-recovery have materialised, particularly in township areas. Despite all their good efforts, however, few of the projects visited had reached acceptable of cost recovery and the consolidation of any of these small successes was made very difficult by the introduction of the Free Water Policy. Projects visited included:

- ***ODI retail:*** where responsibilities for retail water services have been entrusted to a public Water Board, Rand Water, which has mainly focused its actions on the use of pre-payment metering devices.

- ***Kruegersdop municipal water services:*** where a municipal utility has to face the challenge of a considerable expansion in its area of coverage following the municipal reform and attempts to meet this challenge through a heavy use of pre-payment metering devices.

- ***Durban water:*** where a municipal utility has adopted an innovative approach by establishing a tri-sector partnership (between the public, private and civil

society sectors) in order to solve cost-recovery issues in peri-urban township areas.

- ***Kwa Zulu Natal rural services:*** where a development engineer has adopted a community-based approach for developing rural water projects, with interesting lessons for how to run and manage those projects in an efficient manner.

- ***Peddie South within the Eastern Cape BoTT project:*** where DWAF, the South African Ministry for Water, has adopted an innovative contractual approach (the BoTT) in order to harness the capacities of the private sector in order to transfer responsibilities for water and sanitation services to local municipalities as quickly as possible.

In addition, although no specific projects were visited, ERM had extended exchanges with two organisations that are important actors of the WATSAN sector in South Africa and have developed innovative approaches to improving cost-recovery:

- ***The Mvula Trust:*** a specialist NGO working on the provision of water services in rural areas, which recently expanded its activities to the provision of sanitation services but still mostly in rural areas.

- ***PSU International:*** a private company specialising in delivering improvements in their cost-recovery records (by which they mean bill and debt collection records) for water utilities.

Below are brief summaries of the projects examined during the field visits. More detailed information about the overall institutional framework and the projects visited is presented in *Annex F* to this report.

i. Rand Water and ODI Retail

Rand Water is the bulk water supplier for the region of Johannesburg. Following DWAF's initiative, it has signed a contract with municipalities in the ODI region for provision of retail services in former township areas. Given that the cost-recovery record is particularly poor in these areas, Rand Water has put considerable effort into the development and installation of pre-payment meters, for both individual and standpipe connections. Pre-paid meters are seen as a way of keeping down costs through reducing losses from uncontrolled use.

ii. Kruegersdorp municipal water services

Kruegersdorp is a municipality lying West of Johannesburg. Water services are provided through a municipal water company, which is ring-fenced from other municipal services but still falls short of being corporatised. Kruegersdorp is typical of formerly white municipalities whose boundaries have recently been extended in order to incorporate black townships.

However, management quality appears to be significantly higher than in other municipalities: it is akin to the success story of municipal water and sanitation service management. Kruegersdorp municipality has also been experimenting on a large scale with pre-paid metering devices, in a variety of socio-economic environments. Its payment record has significantly improved since the start of these experimentations. This has been matched with particularly good budgeting practices. The municipality is currently considering a possible corporatisation of the municipal services, which should be made possible thanks to the relatively good payment records.

iii. Durban Metro water and the BPD initiative

In 1998, Durban Metro water (and the city of Pietermaritzburg) initiated the creation of two partnerships between themselves (public providers of water and sanitation services in Durban and Pietermaritzburg respectively), a private operator (Vivendi), a local NGO (the Mvula Trust), the Water Research Commission and the local bulk water supplier (Umgeni Water). The objective of these partnerships was to improve water services for the poor in Durban and Pietermaritzburg, particularly through the development of innovative approaches to water services provision. The partnerships were created through two co-operation agreements, with one for each city, which outline roles, responsibilities and financial commitment for these partnerships. Powers in the partnership are equally shared, and financial contributions do not imply more weight in decision-making. (13)

New approaches to service provision developed by these partnerships did largely focus on addressing the cost-recovery challenge. It is in the municipality of Durban that the free water policy was first introduced in Durban, but this policy was largely seen as a cost-limitation mechanism in such a setting. Durban Water established that it would be cheaper to provide 6 cubic metres of water for free to everyone in Durban rather than to try and recover bills in areas that are difficult (and may be dangerous) to access or try and target subsidies onto poor consumers. In many township areas around Durban, payment records have traditionally been very low: there is either a "culture of non-payment" (inherited from the Apartheid era when boycott of services provided by the white rulers was a commonly used weapon) or a "non-payment" culture (which means that people have never paid for a service that was provided for free and do not see why they should start paying from now). In order to increase the financial viability of this policy, they have introduced a number of innovations on flexing service levels, with for example the introduction of restricted services (roof tanks are provided with just a daily allowance every day).

But Durban Water, one of the most efficient water utility in the country, is a special case, as it can easily recoup the costs of this policy through cross-subsidisation from a relatively rich household and industrial customer base.

(13) Note that these partnerships received considerable support and attention from the Business Partners for Development initiative, for which the Kwa Zulu Natal projects are one out of eight pilot projects.

iv. Kwa Zulu Natal rural services: Nkwambase

ERM visited the Nkwambase project, in a rural area North of Durban in the Kwa Zulu Natal province. The project serves a total of 800 households. For this project, the development engineering firm Dynacon works as sub-contractor to Umgeni Water, which is the bulk water supplier in the region of Durban.

Their approach is slightly different however. Umgeni has installed conventional meters (with a lock to prevent tampering) Project operation was initially to be entrusted to a local Water Committee, with elected representatives from the community. However, this committee was disbanded once they ran out of money and had to be replaced by a small Task Team, with more competent and responsible people. This Task Team is managing in difficult times but hopes that a more conventional business unit would be put in place in order to manage the business. In financial terms, most people aren't paying so they have never paid their bill for bulk water to Umgeni. Arrears on bulk water payments have been amounting, but Umgeni, the Project Implementation Unit has not cut them off so far. They are hoping that the municipal council will settle the accumulated debt. The cashier, representative of the task team, displayed some relatively good knowledge of the business. He said that they could not connect anyone who wanted to because costs can be particularly high, so they would need to increase the connection fee in order to cover those costs. In addition, he believed that they would need to increase the tariffs given that two increases in bulk water prices had not been reflected into their retail tariffs. However, they are dependent on the local municipality for agreeing tariff increases.

v. Peddie South and the Eastern Cape BoTT project

In 1997, DWAF signed BoTT (Build, operate, Train, Transfer) contracts with "Project Implementing Agencies" (PIA) in each of South Africa's four poorest provinces. Each PIA is a consortium between private sector actors and NGOs: for example, both the Northern Province (Metsico) and the Eastern Cape (Amanz'abantu) consortia are led by WASS (a subsidiary of Northumbrian Water) and have the Mvula Trust, a nation-wide NGO specialising in providing water services to the rural poor as partner for institutional and social development aspects.

The rationale for designing this type of contracts was to accompany the municipal service reform and to allow a quick transfer of responsibilities for water and sanitation from central government (DWAF) to local governments. Given that in many poor rural areas, local governments did not have the capacity or the financial resources to take on such responsibilities in a short period of time, DWAF developed the BoTT concept for accompanying and overseeing this transfer.

The contracts require the consortia to offer a "one-stop shop approach", covering five areas of skill: design, construction, operation and maintenance, on-site sanitation and institutional and social development. Community representatives work as partners on the project, as members of the Project Steering Committees and Village Water Committees.

These contracts are now coming to an end, as they were initially signed for two-years and renewed once. Both self-criticism (by DWAF, due to the high cost of the programme) and external criticism (by NGO partners, due to their limited ability to strategically orient the projects) are running strong. However, it is generally recognised that these project management structures have been successful at delivering rapid improvements in service delivery with appropriate attention paid to the long-term sustainability of the schemes established in such a way. Private sector operators have been quick in recognising the interest of such approach, and are trying to win more projects outside the BoTT structure directly with local governments. Indeed, following that experience, DWAF decided to develop an "improved" BoTT model contract, which could be used directly by local governments wanting to call on the private sector to develop their water services on the basis of this "one-stop shop" approach.

4 COST RECOVERY - HOW TO MAKE IT HAPPEN?

4.1 INTRODUCTION

Recall the four key cost recovery research challenges this project set itself.

- How are successful (financially) cost-recovering WATSAN projects for poor people in rural and peri-urban managing to do it?
- What are the most useful payment vehicles they employ?
- Does a role for the private sector enable (financial) cost-recovery in rural and peri-urban WATSAN projects to be done better?
- What framework, which can maximise the chances of cost-recovering WATSAN projects for poor people in rural and peri-urban areas should be used?

By drawing upon the theory and findings of the previous two sections, we present an analysis of the factors that seem to encourage financial sustainability in WATSAN projects in rural and peri-urban areas. We identify a series of practical "silver bullet" issues that, if addressed, would help maximise the chances of cost recovery happening.

4.2 WHAT'S IMPORTANT?

A number of important underpinning issues on cost recovery emerge from the theory and our research findings.

4.2.1 *On economics and finance*

- Financial sustainability is vital in the long run as there are not enough public or grant based resources to finance all the existing or new WATSAN projects required in rural and peri-urban areas.
- There is an important distinction between economic and financial interpretations of costs and how to recover them. While most WATSAN practitioners focus on financial cost, it is important in terms of an efficient allocation of water resources across society and the environment, that a consideration of economic costs (or values) is not lost in the appraisal process.
- A gradation of the financial costs that can be recovered by a WATSAN project or programme can be devised. Most current initiatives recover only a few of these financial costs, and hence most WATSAN projects are not financially, let alone economically, sustainable

- Many practitioners misunderstand the terms cost recovery, demand, economics and financial sustainability.

4.2.2 *On income*

- Though quite prevalent, assessing the affordability to poor people of WATSAN services on the basis of the 3-5% rule of thumb can be misleading.

- By using an affordability benchmark, many WATSAN professionals have interpreted the use of a demand responsive approach as one that matches appropriate technology to the perceived affordability (income) of the users. Commonly, potential users in poor communities are offered a range of technical, low cost (affordable) options from which to choose. This can lead to an under supply of services.

- Household income, however, though important, is not the overriding determinant of demand for improved WATSAN services. Poorer people see water as a relatively income inelastic good and are willing to pay more for it, especially in drier areas.

4.2.3 *On assessing demand*

- There is a broad consensus of the usefulness of measuring peoples demand for WATSAN projects, and the sorts of options on offer to do so. However, there seems to be little agreement on exactly what demand assessment is, when to do it, or how to use it.

- The most prevalent and feasible method for assessing the demand of users for WATSAN services is via focus groups.

- In general, when assessing demand, two approaches can be taken.

- An analysis of affordability (based on estimating households' current income and assessing what type of WATSAN service they could pay for); or an analysis of willingness to pay (estimating households' desire for improved WATSAN services)

- They are not the same thing, though both are often called, inter-changeably, "affordability", "willingness to pay", or "demand assessment" studies. The difference can be seen as to whether the study assesses either a households' effective demand (their affordability of a service on offer), or their notional demand (their willingness to pay for a service they want).

- The use of demand assessment, and the willingness to pay estimates it derives from potential users, sits more closely with an economic than a financial assessments of costs. Within a willingness to pay bid,

respondents will value not only the technical option on offer, but also their preferences for many other attributes - the institutional arrangements, the suggested pricing schedule, the credit options on offer, for example.

- Taking a demand responsive approach can seen to be a bit like "social marketing" - designing a new product for the WATSAN market that simultaneously educates consumer preferences about the benefits of competing options. Iteratively, through the use of focus groups or consumer surveys, a demand responsive approach can help reveal the technical possibilities, the preferred institutional arrangements and a cost recovering tariff together to create the right WATSAN "product" for that community. Studies that follow this approach seem to provide (knowingly or unknowingly) more financially sustainable project designs.

- The weakness of the DRA debate was not to focus on the fact that poor users will place a value on a *broad range* of the project's attributes, and not just on the technical options. One key attribute in this wider range are the set of options through which users can be helped to pay for the WATSAN services they want. We have identified, therefore, a gap in the current development of DRA that fails to uncover the relative weights that can be put on service attributes to facilitate pro-poor design[14].

4.2.4 *On paying for WATSAN services*

- The way poor households are asked to pay for WATSAN services affects how much they are willing to pay. Discussing the use of credit or other methods of financial assistance, and the type of payment structure on offer, are important. They can help shape a poor households' willingness to pay.

- A sustainable financing strategy for a WATSAN project or programme may often require, therefore, the building of a source of financing to help poor people pay for access to an improved levels of services and its long run costs, as well as an appropriate technical solution.

- Cross-subsidisation policies and social tariffs can fail to provide incentives to the WATSAN service provider to bill or collect from many poor users; they may create disincentives for these providers to expand their services to low-income areas; they may be difficult to implement in rural areas; and they are not a transparent way of meeting the objective of financial sustainability.

[14] Much recent attention has focussed on the role of social marketing to improve WATSAN buy in among communities. Little attention, however, has been given to a related marketing technique - conjoint analysis - that could be useful for uncovering preference weights for service delivery.

4.2.5 *On charges and tariffs*

- With the right project, poor people will pay for their connection charge to a WATSAN project. Some my need a loan or subsidy to help them.

- An efficient WATSAN tariff policy should be one that reflects the marginal economic costs of supply. This should be the benchmark against which the tariff is designed.

- Standpipe users should be charged a tariff linked to the operation and maintenance of a basic level of service and individual connections be charged the average incremental cost (AIC) of the operation and maintenance, depreciation and capital cost of supply.

- Alternatives to subsidising water tariffs for poor people, can be the use of marginal/ AIC cost pricing for WATSAN services, plus a cash subsidy or a form of credit given to the user, to help pay back a loan for a WATSAN connection or investment.

- With these charging principles in place, poor people can derive a return on their WATSAN asset and manage to run them in the long run. Volumetric charges and other forms of targeted tariff policy can also be introduced within the group. Surpluses can be lent to other groups to start a similar WATSAN project. Without these principles in place, the project will not be financially sustainable.

4.2.6 *On institutions, governance and the private sector*

- The most prevalent obstacle to achieving cost recovery is political interference, inappropriate public policy or a lack of political willingness to institute cost recovery mechanisms. Circumstances can differ, however, between countries. While this is the case in India, in South African the more immediate social demands stemming from an enormous weight of expectation that historic service disparities would be made good, is the greater influence on a cheap water policy.

- The strength of local institutions is important. People-based systems of fund collection, management, utilisation and maintenance are vital to the success of WATSAN projects for poor people.

- The most viable private sector participation options for WATSAN service provision for rural and peri-urban communities are local options. They can include:

- *Community contractors.* They can help foster community empowerment and ownership of the project, but they require social development and technical support.

- *Small scale contractors and suppliers.* These agents can help develop local private enterprise in the water sector.

- *Water and sanitation related NGOS.* These organisations can provide social development and technical assistance.

- *Local private sector services.* Small management consulting organisations, for example, which specialise in billing and metering technologies, can offer services to small water service providers.

- A decentralisation policy that creates the right legal and regulatory frameworks to formalise the status of such local organisations as service providers is important. (Local) Governments and their WATSAN agencies can then make the transition from being a 'provider' of services to becoming a 'facilitator'.

- Formalising the relationships between small-scale private sector suppliers and the main (private or public bulk) supplier in the form of locally established partnership is a longer-term aim.

4.3 *EXAMPLES FROM THE FIELD*

The process of designing and implementing WATSAN projects and programmes, may take account of, to a lesser or greater extent, some of the important underpinning issues mentioned above.

To find out "what works" (or does not work) in the field, we looked at outputs, not processes. We took a (non) cost-recovering project and then disaggregated it to find out the process, which helped to create it. We hypothesised that the field processes, and the commonalities between them that created successful projects, when combined with some of the important underpinning issues derived from the desk study, hold the key as to what makes a successful cost recovering WATSAN project for poor people. *Sections 2* and *3* and *Annexes B* though *F* contain the details of our investigations and findings. We present here the conclusions.

Importantly, for the purpose of this cost recovery investigation, "successful" WATSAN projects were those that were seen to contain the following attributes:-

- They are financially sustainable – they recover their (long run) costs.

- They do not rely on large external grants to help them out now, or in the future.

- Other groups of poor people can find ways to replicate the project, without a large reliance on external grants, and are interested in doing so.

In contrast, WATSAN projects that don't work do none of the above. They don't recover their long run costs, they will need grants to keep them going (say, within every 20 years), and there doesn't seem to be much sporadic uptake of their approach by others, without the offer of a large external grant.

It is important to note that many WATSAN projects have wider aims and objectives than the financial sustainability ones outlined above. Accordingly, our analysis is by no means comprehensive in terms of defining success and failure – it concentrates solely on the aspects of cost recovery that induce financial sustainability.

4.4 *WHAT DOESN'T WORK?*

4.4.1 *Projects that don't pay for themselves.*

Many development agency WATSAN programmes and (to a lesser extent) NGO WATSAN projects often don't have an explicit aim of ensuring that their investments pay for themselves, or recover their financial costs in the long run. Common "cost recovery" goals for these projects are 0 to X% of capital and 100% of operation and maintenance costs to be paid by users.

These cost recovery objectives mostly reflect a desire for the project to meet basic needs, to ensure an equitable use of the subsidy they offer, or at best to break even on budget.

Two simple questions then emerge:

- What happens in the long run?
- What happens to those people outside of the area of the project or programme?

The answer to both is equally simple – another grant will be required. It is the same answer for a public agency WATSAN project with a budget of millions of dollars as it is for small grant project with a budget of hundreds. The grant cannot continue in perpetuity, and the grant cannot meet everyone's needs.

There is simply not enough public sector or NGO money (portions of people's tax, or their bequests) to fund these sorts of "public sector" WATSAN projects and programmes for poor people, especially when considering the many other worthwhile demands on fiscal resources. Somebody has to pay for the WATSAN projects, in the long run.

4.4.2 *Projects that are not flexible enough to respond to demand*

The evidence suggests that those WATSAN projects that work best for poor people have asked them, usually via focus groups, what they want from their services and what mechanisms would help them best pay for it. Where people

have been unsure that they want, for example, sanitation, social marketing techniques have been employed to show the tangible financial and economic benefits of the option.

Clearly, the technical options on offer can be limited, by physical and logistical constraints. Poor people can be consulted on these technical options (type of pump, tapstand or private connection etc), and their preferred choices selected. But an assessment of demands should not stop there. Empowering poor people in the wider institutional design process, by discussing their preferences over how these WATSAN options are initially paid for, maintained, operated, charged for, owned and developed over time can provide a much stronger foundation for a cost recovering project.

Indeed, when engaged in this manner, poor people start to consider the financing issue for the WATSAN intervention in the wider context of their own poverty and their livelihoods. The offer of credit can then help to both increase their sense of livelihood security and bind them to repayment. It can also lead to growth and sustainability of the WATSAN system, as ways of using the surplus or supporting finance derived from the scheme can be devised which help people both to move out from poverty and/or to expand or replicate the scheme for others.

Without this wider context of empowerment in the demand assessment process, however - of working out how to turn notional into effective demand - the WATSAN project is likely not to last or grow.

Many larger projects, while maintaining a 'demand focused approach", often fail to be flexible enough at the local level. Disbursement mechanisms are fixed and systematised, with common cost recovery goals, as mentioned, of X% of capital and 100% of operation and maintenance costs to be paid by users. Even the managers of some of these projects sometimes think the users could pay more.

At worst, these projects, by using an initial affordability benchmark, interpret the use of a "demand responsive approach" as one that matches appropriate technology to the perceived affordability (income) of the users. Commonly, potential beneficiaries are offered a range of technical, low cost (affordable) options from which to choose, with low targets of associated cost recovery. At best, some lines of credit or income generation activities are linked to the bundle of pre-determined options on offer, with higher levels of cost recovery resulting (X% capital costs; up to 100% operation and maintenance costs). Neither are long-term solutions, however.

However, finding innovative ways for the users to make a return on their assets, or focusing on the output - a financially sustainable WATSAN intervention - whilst leaving the process of implementation up to the community and local support agency (usually a good quality NGO, or an innovative locally based private sector agent) are much less prevalent models of demand-based design.

4.4.3 *Projects that don't create sustainable institutions*

The creation of project management or implementation units (PMUs/ PIUs) is common among large WATSAN programmes or projects. They are linked at federal, state or district level to Water Supply Agencies, and aim to manage or control the disbursement of the project's funds to those WATSAN initiatives that meet the requirements of the programme (of which some cost recovery targets are included).

While the PMU's can be useful to the public agency to account for their funds, they are often not sustainable institutions and may be counter-productive to the objective of creating or supporting financially sustainable WATSAN projects that are managed at the lowest level of decision-making possible. PMU's can be counter productive in two ways:

- They will tend to draw the better employees away from the Water Service Agency to work with international experts on the programme or project in the PMU. Yet it is within the Water Service Agency where innovative thinking and leadership will be required, in order to change from a provider to a facilitator of locally managed financially sustainable WATSAN projects in the long run.

- They will focus on "capacity building" or "training the Agency staff" to re-orientate their approach to WATSAN delivery, but based upon an unsustainable source of funds (the programme budget and the grants it provides) and a lack of cost recovering, or locally flexible projects, on the ground that can be seen to financially sustainable in the long run.

Hence, when the PMU closes at programme end – after four years for example – ex PMU staff will have to reposition themselves back in the Agency with new goals, a changed remit and higher aspirations. However, they will be unlikely to have a sustainable source of funds upon which to make these changes the project recommended, or to sustain the investments the project did make. Further, they may be left with a systematic approach to community co-financing (maybe now enshrined in State policy) that focuses less on being flexible to local conditions, on empowerment and on outputs and more on a set of target cost recovery benchmarks (such as implement WATSAN projects that recover X% of financial costs from users), which, again, maintains a reliance on external funds in the long run.

4.4.4 *Examples*

Most of the projects that fit the above descriptions are large scale, public (donor) agency driven projects. As such they are more prevalent in India than n South Africa. The case study project and programmes in India that fit this description include:

- The World Bank Swajal Project in India (US$63 million). A PMU based in Uttar Pradesh overseas community contracting and target cost recovery objectives for water supply projects of 10% capital costs and 100% operation and maintenance; 60% cost sharing for sanitation investments.

- The World Bank Kerela Rural Water Supply and Environmental Sanitation Project in India (US$60 million IBRD loan). A PMU in Kerala and district PMU's oversee NGO facilitation of beneficiary group WATSAN schemes; target cost recovery objectives for water supply projects of 15% capital costs and 100% operation and maintenance; 20% cost sharing for sanitation investments.

- The DFID Andhra Pradesh Urban Poverty Project in India (US$134 million grant). Two municipal strengthening units based in Andhra Pradesh; different municipalities prepare Municipal Action Plans for Poverty Reduction, with varying levels of grant input for WATSAN projects in slums. Aims to work within existing WATSAN tariffs of state, and improve cost recovery by mainly reducing supply costs.

There are many other examples of large development agency projects that are not financially sustainable (in fact the majority are not). These case studies are simply illustrations of the projects that staff members were kind enough to introduce us to, during field trips to India and South Africa.

However, a counter argument to the criticism that these sorts of projects aren't financially sustainable (or really why they should be as public sector projects) is the premise that these projects can influence policy. This is an important point. However, if WATSAN financing policy is to be influenced, it surely should be influenced properly. However:

- If the policy is influenced such that these projects are to be replicated in other regions, this will mean a need for further (quite significant) grant or loan based assistance from state, federal government, or external sources to do so. There will not be enough public funds to meet every poor community's needs.

- If the policy is influenced such that existing or new WATSAN projects should aim to recover a portion of capital and all operation and maintenance costs from users, then further grant or loan based assistance from state, federal government, or external sources will still be required when the assets are run down in, say, 20 years.

- If the policy is to focus the Water Service Agency, not on the objective or output – support the development of WATSAN projects that make a return on their assets– but on a part of the process - recover these targets costs from users - then it is not financially sustainable.

4.5 *WHAT DOES WORK?*

The WATSAN projects for rural and peri-urban users that do work have focused firstly on empowerment in the design process

4.5.1 *Projects that follow an iterative process to design a demand driven "product"*

The projects that are financially sustainable have followed a number of iterative design steps, taking account of "notional demands":

- They discuss the social or financial costs that the potential beneficiaries currently pay or incur with respect to their existing WATSAN services.

- They identify the range of WATSAN attributes, which need to be improved, for example a new technical investment that makes supply more convenient, a new payment system, a new ownership structure, or a combination of these things. Often, these options cost the beneficiaries more than they paid before. However, the options are valued highly and they may be preferable to the economic costs they were incurring prior to the project.

- They discuss ownership and management issues in some depth, using local resources to manage and run the project. Also, issues of financing are also discussed and commonly agreed solutions found, particularly in relation to how people will pay for the project, if it were theirs in perpetuity?

4.5.2 *Projects that use a facilitating organisation who knows the poor well*

Sometimes, an organisation, such as a local NGO or a locally based private sector service deliverer has facilitated the iterative process to design a demand driven WATSAN "product", drawing upon information, advice and experience from initiatives elsewhere. In other cases, whether through crisis or exasperation, communities, their leaders, or a local entrepreneur asked these questions then sought a solution. But either way, the locally based, successful outcome tends to be the same.

With limited access to finance, a small-scale, or a non-networked, water supply or sanitation system emerges from these approaches. Local rules and local charges can be devised and become prevalent. Differences in rules are allowed between different schemes. Local institutions oversee and regulate the system. Often training is given where needed, and local partnerships are developed.

Often these schemes flourish in spite of, not because of national policies, local government, WATSAN agencies and sometimes the Donor Community. And because they are often local, small-scale initiatives they tend to get less exposure if they are successful than the larger Donor Agency project and programmes.

4.5.3 *Projects that use small grants and supporting finance to encourage replication*

Often a small amount of "seed-corn" capital investment is provided as a trigger to get the scheme going, and a support network for both financial and technical assistance is also developed.

Without this external seed-corn provision, the community may provide 100% of capital costs, borrow money to do so, or rely on an entrepreneur, or a wealthy benefactor to help them. In these cases, crisis often dictates.

With limited finance available the onus has immediately been on the local institution to run the scheme they have designed as sustainably as possible. The associated costs of doing so, and hence the revenues required, quickly become transparent to all users.

Consequently, these systems have often managed to create an operating surplus or a return on their WATSAN asset, allowing for long term financing, or for the financing of other initiatives.

An informal "seeing is believing" tactic, rather than the carrot of further grants or the persuasion of detailed dissemination strategies (reports, papers, workshops etc), is often used whereby neighbouring households and villages (and decision makers) watch, learn and copy the success of the project. The surplus derived from the original WATSAN asset can be used as a loan to the next scheme or village to get the next initiative going. Again, once a new community shows interest and demand, then another, one-off, but limited, "seed-corn" grant can be provided.

4.5.4 *Projects that focus on outputs*

In general the successful WATSAN projects have focused on outputs and not particularly on systematic or specific cost recovery targets. This may be the case because a crisis situation required a community to focus on what was needed to be done, and the lack of finance available meant that it had to be done as cost effectively as possible, and last in the long run. Or, it may be the case that a facilitator encouraged the community to think about what they wanted from their WATSAN services and what they would have to do or pay to make it keep going. Working back from these outputs (financially sustainable WATSAN projects), then innovative methods and processes for local management and cost recovery are often devised by the users, such as pay and use latrines.

In general a focus on the benefits to be derived from a potential WATSAN project (and then working out how to minimise costs and sustain them financially, institutionally and technically) seems to be more financially successful and create more innovation and local ownership then a project that

focuses on the supply of money coming in and how it might best, or most fairly, be spent.

4.5.5 *Examples*

- Olevanna WATSAN project, Kerela, India - 100% community financed WATSAN schemes generating a return on the assets enough to fiannce into the long term. Now receives some supporting funds under India' s decentralisation programme.

- The Urban Slums Health and Sanitation Improvement Programme, Tiruchirappalli, Tamil Nadu, India - Water Aid working with the Indian NGOs GRAMALAYA, SCOPE and SEVAI as implementing agencies. A seed-corn grant provided for community sanitation in slums, implemented by local community as a "pay and use" toilet; creates a high operating surplus and community fund to support further WATSAN initiatives.

- Rural Water and Sanitation Programme, Kar Hikulam village in Tamil Nadu - Water Aid working with the Indian NGO SCOPE as the implementing agency. An initial seed-corn grant and parallel community fund system catalyses sanitation investments to be replicated throughout the village and neighbouring villages. Health cost savings and associated kitchen gardens ensure financial sustainability of the toilets.

- Odi retail and Kruegersdorp municipal water services, where following extensive community consultation, the introduction of pre payment metering devices help to manage demand and minimise costs and illegal connections.

- Durban Water Metro whereby locally based flexible service levels were introduced.

- The Eastern Cape BoTT where partnerships between local government, the private sector and NGOs have helped to deliver some financially sustainable WATSAN schemes.

4.5.6 *Conclusion*

Thus, in order to encourage successful, cost recovering WATSAN projects that deliver services to the rural and peri-urban poor, the challenge seems to be to

- Work at the local level.

- Develop partnerships between the users, local NGOs or CBOs and local private sector water providers.

- Undertake an iterative process to design a demand driven WATSAN "product".

- Focus on the output of the project required and work back to create the "product".

- Provide small amounts of "seed-corn" grants to kick the process off.

- Get the users to find a way of managing costs and making the initiative pay for itself in the long term.

- Find ways to replicate those successful projects that don't rely on heavily on external grants.

The last two of these four points, which relate to sustainable financing, can be achieved by focusing on the (economic) benefits to be gained from the project. Through working at the local level, innovative ways of managing or paying for the project can be designed, often with the help of a supporting community finance mechanism. If the output is set such that an operating surplus needs to occur, then specific cost recovery targets need not be made systematic, unless the cost of capital is to be included. However, in the first instance, a seed-corn grant may kick start this process. Costs of capital may emerge as an issue for second or third generation projects, which draw on the surplus of the first to finance the capital for theirs.

4.6 *WHO CAN PROVIDE SUSTAINABLE FINANCING?*

4.6.1 *There is a market*

There is clearly a market for WATSAN projects for the rural and urban poor, which exists, for someone to enter. The number of customers is huge, their demand for services cannot be questioned and the financial returns on the right products can be impressive.

- Just one of the 60 schemes in the Olevanna Programme was making an operating surplus of US$630 a month, with no capital cost debts to pay back. Across the 60 schemes, taking a more conservative estimate of US$400 surplus a month, this could equate to an operating surplus of US$24,000 a month or US$ 288,000 a year.

- In the Urban Slums Health and Sanitation Improvement Programme, Tiruchirappalli, one pay and use latrine was operating at a surplus of US$125 a month (this a slum toilet). Over a 16-month period, this one toilet block grossed an income of US$3,290; the community spent just over US$1,280 on operations and maintenance etc; US$1,070 of income was spent on other WATSAN and community investments; and just over US$940 has been banked. Currently there are 6 pay and use toilet blocks. There are lots of slum dwellers.

However, as discussed this market is focused on very small scale, local level innovations, with poor people as the key decision makers. Their WATSAN "products" differ in different locations and circumstances, and their institutions, management structures and payment schedules consequently differ as well.

This is not a market, therefore, that the Donor Agencies, the international private sector or the International Finance Institutions (IFIs) operate well within. Limited Donor Agency success in financially sustainable WATSAN projects is an illustration on this. For the international private sector, it is generally too risky a venture to invest time and resources in such a large and diverse number of rural and peri-urban schemes with such a heterogeneous set of consumers, management options and cash flows.

The international private sector needs an economy of scale - large sunk costs - for their finance to work and a minimal risk, medium-term time horizon within which to accrue its profit from the investment. Costs can be minimised through standardising and systemising collections, maintenance and other activities. And these attributes - large amounts of sunk cost, systemised design, repair and collections mechanisms - are exactly not what seems to work for the successful, financially sustainable WATSAN projects in peri-urban and rural areas.

It seems therefore that the international private sector could operate as a bulk supplier or a wastewater treater, but not as a financial underwrite and not as a lone actor delivering WATSAN services for all of the rural and urban poor.

The international financial institutions may be able to provide some of the capital required to kick-start these local sorts of schemes. However, IFIs are not geared to manage diverse portfolios of small-scale "seed corn" investments, involving a whole range of local ownership structures. IFIs are more keen to divest US$ millions and at a cost to the recipient in the form of a soft loan. Hence, some of the kick-off finance may be available from the IFIs, but thereafter options are limited.

Furthermore, neither the international private sector nor IFIs work very well with the poor. In fact, they often hire NGOs to do this work for them or, more recently, are being encouraged to work in partnership with NGOs.

The NGOs of course, even the INGOs, don't have access to the amounts of "kick-start" funds necessary to cover all the small-scale WATSAN projects that are required. Further, many NGOs can also suffer from a public-sector approach to project design, whereby long run costs are not recovered.

This leaves just one group of stakeholders who have the money in the long run, the incentive and the ability to develop these types of WATSAN projects, identified as successful in the long run for the rural and urban poor.

4.6.2 *The poor*

Only the poor really have the money and the incentive, in the long run to design, manage, and run these WATSAN projects as they so desire.

If one were to look to see how much the poor, in total, are spending, or willing to spend if their nominal demands can be made effective, on WATSAN supplies, then this may be the only (and cumulatively the largest?) source of finance really available for most of the long run expenditure required for WATSAN services in rural and peri urban areas. And who better to scrutinise how the limited finance available from other sources is spent and what kind of WATSAN "product" can best be got for the money, than those who need that it the most?

Thus, it seems that donors/IFI/state/private sector money can only help, at best, to provide a small kick-start to the WATSAN project process, which seems sensible from an economic point of view. The design, management structure, institutions, payment schedule and other arrangements of the WATSAN product should be left to the poor to decide upon, with help to make informed choices.

It is perhaps quite simple. In relation to developing a financially sustainable WATSAN project in a rural or peri-urban area, use the poor, or someone who can work with the poor well (a local NGO or local private sector entrepreneur), to work to an output:

Design, build and operate (and transfer if appropriate) a WATSAN system the poor want, using most of their money to finance it in the long run, with a supporting community financing system that can help people to pay. Ensure that the long run costs of these schemes are covered. Give the users a small amount as a loan or grant to kick the project off, and ask for it back over a longer time period. Allow any operating surplus that is created to be invested in further WATSAN or other community development initiatives. Perhaps find ways to minimise costs through upfront charges, or to maximise intra-community choice through offering a range of flexible service options at different prices.

If the poor designed it, own it, and like it, they'll sustain it. If others like it, they'll copy it. The others may even ask to borrow some money from the project's surplus to help finance their own version.

4.7 *STEPS FORWARD*

While a simple concept, designing a financially sustainable WATSAN programme or project for the rural and peri-urban poor, clearly requires a wide range of complex and critical issues to be worked through, at both macro and micro levels. Many of these issues will be challenging shifts in policy and

approach to the Donor Agencies themselves. Based on the evidence of what seems to work, however, the following practical steps are seen as critical.

4.7.1 *A Water Supply and Sanitation Finance Policy for the Poor*

Financially sustainable WATSAN projects work best where a decentralisation policy is present.

A clear and uniform national policy for the investment and longer term financing of WATSAN services in rural and peri-urban areas is therefore required within the country that assistance is to take place (a "WATSAN Finance Policy for the Poor").

The objectives of the policy should be as follows.

- To decentralise WATSAN responsibilities for financing, implementation and development to the lowest possible level of decision-making.
- To provide a legislative and regulatory environment that allows and helps the poor to undertake their own projects, with supporting agencies and information available if required.
- To promote local partnerships between community groups, NGOs, the local private sector and Government Agencies to help deliver the WATSAN services in these projects.
- To develop self-sustaining community investment finance initiatives to help poor people finance the WATSAN schemes they want.
- To focus pro-poor WATSAN design only on those outputs that sustain themselves financially in the long run. Only those that are designed to be financially sustainable should be able to access supporting funds.
- To promote the need for iterative, demand focused design processes that can strengthen key parts of the WATSAN "product" to suit local conditions, for example particular institutional or payment arrangements, or certain technical components, such as sanitation.
- To ensure that water resources management issues are considered in the design, pricing and financing process.

Agreement by donors and government agencies on the core objectives of this WATSAN Finance Policy for the Poor is also essential so that Government interference doesn't occur and markets are not distorted by different donor agencies offering differing levels of financial assistance or conflicting approaches.

4.7.2 *No Easy Money.*

Lowering the marginal utility to the poor of each WATSAN investment on offer, through widespread and blanket implementation based upon grant financing and/or free usage for all, does not create a financially sustainable situation and distorts the net economic value of the WATSAN product. Many examples show that if poor people want a WATSAN investment, in most cases they will pay for it or seek ways to help them pay for it. Non-payment is the political or historic exception (such as in South Africa), not the rule. This is true for part-capital (and full capital cost payments in many cases) as well as recurrent cost payments.

Often examples of people's own payments for 100% of the WATSAN schemes have arisen through a crisis in supply. The aim is to avoid crisis, while capturing the desire and ability to pay and take a stake.

New projects should not grant invest more than 50% of capital costs. Supporting financial mechanisms are important to help people pay for the remainder, and should be kick started through a one-off grant. Replication, however, should not require any further capital investment grants to the same level. New users should seek to draw mostly upon the financing mechanism of the original project.

4.7.3 *Think small.*

Rural and peri urban WATSAN schemes are often non networked, or fall outside of the regular networked tariff system. Prior to the project, successfully networked coverage is usually very low. Hence, many new initiatives will have to be designed and created. Furthermore, rural and peri-urban communities are not homogenous either within or between themselves. So many smaller schemes should be encouraged that suit their particular users best. This could be on a village by village or on a slum-by-slum community basis. Smaller schemes mean lower exposure to the risk of financial failure. Micro-networks, or non-networked systems, with up to about 30 households per group seem to be a feasible size for success.

4.7.4 *Think many.*

Take the "starbucks" approach. Pepper a neighbourhood, or rural area with several small schemes, each having been iteratively designed to suit very local needs. Localise the WATSAN product, and then people will treat it as their own innovation.

4.7.5 *Think unsystematically*

There will be many different ideas and approaches as to what may work. By taking an output based approach, it doesn't matter so much what the design of each project in the programme is (as technical options are limited, people may choose differences in the institutional, payment, management options), so long as minimum (technical, social, environmental) criteria are met and the

project delivers the output required - a WATSAN project that people want, which sustains itself financially in the long run. Some ideas and designs will work and some will fail. The ones that work will quickly be replicated and the failures will be forgotten, or learned from. With a stake in their own project, people will also choose their options carefully to match their local conditions.

4.7.6 ***Others will know whom the poorest are. Use them to design and deliver local projects.***

There are usually better placed organisations, grassroots or local NGOs, CBOs, community groups or local vendors, private sector actors or informal service providers, who know who the poor are, what they want and what they will pay for in terms of WATSAN services; or who can find out quickly and efficiently if not.

Often a bigger INGO, or other sort of Partner-Organisation (a local WATSAN engineering or pro-poor consultancy firm, for example) will have a good contact network with these local actors.

Via the INGO or Partner Organisation, therefore, the Donor Agency should encourage these grassroots organisations to identify the initial desires of the community, rather than conducting its own research. In using grassroots organisations for this initial information exercise, their potential to be local service coordinators can be ascertained by the Partner Organisation.

Once a network of local service coordinators has been identified from among the grassroots organisations, the Agency should use the INGO or Partner Organisation to maintain this network (which may include local water user groups, local private sector operators, CBOs, NGOs or informal service providers), with an aim to help them form local partnerships to develop and manage a portfolio of small-scale WATSAN projects with local users. Training in long term financial planning, social development and technical issues can be provided via the Partner Organisation.

The Agency should encourage the INGO or Partner Organisation to manage the grassroots organisations and their implementation of these local WATSAN projects via simple, performance based, or output-focused contracts.

The Partner Organisation can then help to coordinate the design, implementation and management for the Agency of a wide range of many small WATSAN projects, which are run on a day-to-day basis by these grassroots organisations and local user groups. Risk of overall contract failure to the INGO or Partner Organisation is minimised through this breadth of portfolio and service deliverers, but the incentive for the grassroots organisations to perform on service delivery and other targets, on a case-by-case basis, is maximised through reputational risk or loss of contract to supply the local users, or by the fact that they may well be the local users themselves.

To start with, some seed-corn money, disbursed by the Partner Organisation to the local service provider, may be required either for capital investment or to kick start savings schemes to help pay for the local WATSAN projects. Following this initial injection of funds, all long term costs for the project should be sought from its users.

Quite simply, if the local project works it works, and its customers will becomes its best advocates for replication. If it doesn't work it will fold, but the local contractor or user group will face the loss of her stake. If the local contractor knows her market, the project should not fold, but should organically grow.

To maximise financial sustainability, incentives might be given to encourage local service providers to draw as least as possible upon the Partner Organisation's funds for capital investment grants and more from the community themselves and the funds available to kick start community savings schemes or WATSAN funds.

4.7.7 *A successful WATSAN project will replicate itself*

Performance satisfaction about each local scheme would come via feedback from the community themselves. Success at this level will be measured by local replication and uptake; capital and longer run costs will de facto be recovered, especially with good tutalage from the Support Organisation. If people replicate the WATSAN project, with no external grant funding, they obviously like it, want it and are willing to pay for it.

The demonstration effect is a critical factor in success, not only on a community-to-community basis, but also in terms of changing the mindset of local WATSAN agency staff, local, regional and national decision makers, and donor agency WATSAN personnel.

4.7.8 *Evaluate success on outputs*

The Partner Organisation should have its own performance evaluated based on how many smaller WATSAN projects are created *and then* sustained, how many are replicated and by asking local customers what they think of the project; success is not equated to how much money was disbursed (in fact, the reverse) or what technologies were used. Innovations in terms of local management, payment and financial structures should be looked for and the successful ideas encouraged and knowledge transferred.

Key indicators such as for social development, environmental and health can to a greater or lesser extent be focused upon depending on whom the Partner Organisation chooses to contract to deliver services at the local level, or who they choose to help provide additional technical assistance. However, these indicators should be monitored and evaluated at key points in contract renewal, and the contract refocused or re-tendered if needs be.

4.7.9 *Don't use rules of thumb in steering design*

Communities and hence the WATSAN projects they like, will differ. The Partner Organisation, in collaboration with the Donor Agency should concentrate on the outputs and indicators that they want to see achieved and the grassroots contractors should be left to find the right process that people will buy into.

4.7.10 *The State cannot be ignored, but a mindset change will be required.*

However ineffective or awkward the state WATSAN service agencies and decision makers may be at first, they must not be ignored. They can continue to implement their schemes alongside, if necessary. However, once some grassroots successes are seen, their opinions on payment levels and management innovations will probably change. Then the challenge will be for the Partner Organisation to build capability within the state agencies in financial understanding and local contracting/ regulation/ evaluation procedures, so that the local state structures can gradually take the reins. To move from a supply and target driven mindset in the state WATSAN agency to one of managing contracts focused on outputs, is difficult. However, the "seeing-is-believing" aspect arguably provides a more powerful steer than simply building capacity.

4.7.11 *The right financial architecture is vital.*

To maximise the chances of success, the portfolio of local WATSAN service delivery projects has to be accompanied by limited sources of grant or credit to oil the wheels of the first initiatives. With the right financial architecture in place, projects can often create surplus revenue, which can be re-lent, through user-group-to-user-group networks to help develop replicate projects.

The cornerstone of success will be to firstly unpick the key financial and economic drivers (cost savings, time savings, revenue generation, less medical bills, other positive attributes) that will enable the WATSAN investment to be easily marketed to potential users; and then to create a payment mechanism and related financial support structures (community funds, savings clubs, revenue streams from the intervention etc) that can help to turn nominal into effective (paying) demand.

4.7.12 *Have a private sector company oversee the contract*

Development Agencies find it difficult to manage WATSAN programmes with a private sector mindset. They look for break-even, or equity related markers, in relation to financing and are not good at creating sustainable financing arrangements.

The Agency should place the overall WATSAN programme management in the hands of a private sector company, with the responsibility for purpose level, output delivery being theirs. The Company will be able to interact with the Agency, the Partner Organisation and the State Partner in terms of

training, technical advice, strengthening of financial sustainability issues, monitoring and evaluation. With overall output achievement resting with the Company, not the Donor Agency, the Agency can replace either the Company or the Partner Organisation and the integrity of the programme with the recipient State Government and its population will remain. Again, disbursements to the Company could be sequential, and based upon outputs being achieved. Financial incentives to deliver could be based upon key performance indicators at the programme level being met - financially sustainable and replicable local schemes, which are equitable and institutionally robust, with feedback coming from the users, the Partner Organisation and the State Partner.

An overview of how to take these silver bullet issues and design a cost recovering WATSAN programme upon them, is presented in the accompanying Guidelines to this position paper.

4.8 *THE CHRONICALLY POOR*

Much of the previous discussion, however, focuses on the poor in rural and urban areas who are not in a crisis position. They have access to social networks, credit and information, however limited these may be.

However, there is one other group of WATSAN users not yet discussed. This is the *chronically* poor, usually located in rural or more remote areas. This is the target group, which humanitarian or emergency assistance organisations cite as those who really can't afford to pay for WATSAN services, or who can't assemble the resources to mobilise themselves.

Whether they are suffering from economic collapse, military conflict, post-conflict stagnation, extreme environmental stress, political/cultural/ethnic biases in policy or society, or combinations of these issues, there will be certain groups of people in certain locations who simply will not be able to engage in, or pay for, a demand driven WATSAN project.

They own no assets (they may have lost them all, or never had any), they have no social networks to speak of (there may be social fissures within as well as between communities), and they have absolutely no cash or other savings, or access to formal or informal credit networks.

Yet WATSAN services are often close to the top of the list of their demands. And the need to create financially sustainable WATSAN investments for this group, is no less pertinent than for others, and is perhaps even more so if an attempt to build this group away from dependency on grant based aid is to be propagated.

In these circumstances (and assuming grant-based emergency humanitarian assistance is not a long term option), a different starting position can be taken. In these circumstances it is important to

- Firstly examine *why* people are so chronically poor (perhaps by using a PPA process); then

- Assess which assets, if invested in, could best help in assisting to build them out of poverty. In many cases (especially in semi-arid areas) the key asset will be water supply and, less obviously, sanitation.

By taking more of a strategic *livelihoods* approach towards poverty and identifying the WATSAN investments that, in these cases, can be a means to help people out of poverty, rather than simply an end in itself, an important shift in WATSAN implementation design occurs.

In this way, water and sanitation interventions can be viewed *strategically* (as income generators, money savers, livestock waterers, land investments, dwelling/ lifestyle improvements etc); as things that can add value to people's livelihoods, help to alleviate poverty and facilitate longer term planning.

By encouraging payments in kind towards their development and payments for the coverage into the future of their recurrent costs, and through a sympathetic participatory design process (which may include the building of an extended household or group network for management), the investment can become part of people's (and communities) asset base, and therefore one that they will seek to sustain and use themselves to their best advantage.

This could be step one in the process towards the kinds of initiatives mentioned in the earlier section. WATSAN can thus be seen as a turning point, or a catalyst to improving these people's livelihoods

The accompanying guidelines to this report also focus therefore on how to design and development strategic WATSAN investments for the chronically poor

A suite of annexes in the Guidelines will provide technical information on how to calculate the costs of WATSAN projects and how to recover the costs.

5 COMMENTS

While we feel that some key steps have been made through this research in the development of practical recommendations for designing financially sustainable WATSAN projects for the poor in rural and peri-urban areas, there are still are number of clear opportunities for further work, whose outputs could feed usefully into the policy agenda on this issue.

These opportunities can be split into more blue skies research and more action-research orientated exercises.

5.1 BLUE SKIES RESEARCH

- The undertaking of further analysis of the valuation of key attributes of the WATSAN product, through perhaps the development of conjoint analysis as a demand assessment tool.

- The undertaking of further analysis as to the potential use of a much wider meta-analysis study to provide pointers on the key drivers for demand, perhaps in particular geographical regions or for particular types of technology, or income groups.

5.2 ACTION ORIENTATED RESEARCH

- The broadening out of the strategic policy and programme design framework on financial sustainability in the WATSAN sector, which we have presented, to draw upon a wider set of country experiences and WATSAN professionals, perhaps through partnership with the World Bank or the UNDP/ World Bank Water and Sanitation Programme.

- The implementation of a small programme of projects, based upon the recommendation we have developed. ERM together with Water Aid would be happy to trial such an approach in a pilot project for DFID, perhaps in India. A key output would be to show that, with minimum grant based inputs a cluster of financially sustainable and self-replicating WATSAN projects can be developed in partnership with poor users in rural or peri-urban areas.

Annex A

Logical Framework

A1 Logical Framework

Narrative summary	Measurable indicators	Means of verification	Important assumptions
Goal W1 Improved Assessment, Development and Management of Water Resources W4 Raise the well being of the rural and urban poor through cost-effective improved water supply and sanitation			(Goal to super goal)
Purpose: To review and interpret cost recovery mechanisms across a wide range of WSS schemes in order to recommend a portfolio of best practices for achieving financial sustainability and maximising the potential for private sector partnerships. The investigation will focus particularly on those sectors where the client base is poorest and cost recovery is presumed to be most difficult.	Strategies are available for developing a range of context-specific forms of cost recovery and institutional arrangements able to produce financial sustainability within those WSS sectors currently regarded as "more risky" - eg rural and peri urban areas.	1. Water and sanitation schemes in poorer areas are seen to be affordable and potentially successful - more investment, expansion and replication takes place within and across countries. 2. Take up of connections and supply options by the lowest income households.	(Purpose to goal) There is a recognition of a wider potential for cost recovery for water and sanitation schemes involving a wider range of ownership and operation structures than the current models of private sector participation which focus on the "lower risk" urban consumer.
Outputs: 1. A report on what seems to make a successful rural /peri-urban water and sanitation project, in terms of financial sustainability, user "buy in", tariff structuring and private sector involvement. The report will contain: • The results of a survey and literature review indicating the current understanding about cost recovery in WSS projects, levels that are currently being attained, an analysis of what aspects of project design make it work, and the extent to which demand assessment exercises play a role and are useful. • An analysis of the key attributes of case study WSS projects in India and South Africa that maximise private sector involvement and cost recovery • A practical methodology for project design that links the twin issue of demand assessment and successful cost recovery mechanisms in a way that maximises the chances of private sector participation. It will be based on real project data and	1. A final draft report and draft best practice guidelines are produced for DFID and WEDC respectively. 2. Through combining with WEDC's outputs under R7386, dissemination occurs through the web and the production of a suite of hard copy guidelines. 3. Agencies, NGO's and water service operators in the key project regions are actively involved in the research process. 4. Publications reviewing the limits of current service provision and the potential for cost recovery in more risky sectors are produced	1.Mailing lists and key informant addresses. 2. Inception and progress reports to DFID 3. Paper manuscripts for review and publication 4. Referees outputs from journals 5. Publications, draft final report and draft text for a manual.	(Output to purpose) WSS project managers, NGO' s, and water agencies provide information relating to strategy, targets for cost recovery and exposure to risk.

Narrative summary	Measurable indicators	Means of verification	Important assumptions
other existing frameworks or models for WSS design, and will maintain a focus on user affordability and welfare. 2. Draft texts for a Guidance Manual and web site on the theory and best practice guidelines for achieving cost recovery and private sector involvement for water and sanitation schemes in peri-urban and rural areas. These will include a stepwise version of the developed methodology for achieving cost recovery.			

Activities: 1. Undertake discussions, surveys and dissemination exercises with DFID, Water Aid and a range of other multilateral and bilateral donor agencies and IFI's to develop a series of WSS project examples, models and frameworks in peri-urban and rural areas, related to cost recovery initiatives or demand assessment. 2. Undertake discussions with some key private sector actors to discuss the attributes of water supply and sanitation projects/ wider policy environments, that maximise the chances and success of their involvement. 3. Undertake a case study review of the evidence and experience (or lack) of demand assessment and cost recovery initiatives for selected water and sanitation projects in peri-urban or rural areas of South Africa and India . Projects where the private sector has played a role, will be particularly sought out as case studies. 4. On the basis of the findings of 1, 2, and 3 above, develop a text for a practical and robust stepwise methodology for WSS project design, which aims to maximise the chances of financial sustainability (cost recovery) in these difficult markets. Its *replicability in different regions or policy environments should also* be considered.. 5. Develop the text into a project report for DFI D, a draft "best practices" manual for WEDC to use in the production of a suite of guidelines for DFID, and a draft web page, again for WEDC to develop and launch in conjunction with their own research..		Articles reviewed and key citations made. Bibliography of key citations from published and greys literature is kept. Postal address list Postal surveys analysed Disbursement records	(Activity to output)

Annex B

Literature Review

B1 LITERATURE REVIEW

1.1 INTRODUCTION

A literature review was undertaken at project start, October 1999. This concentrated on a review of papers, reports, overviews and conference proceedings about demand assessment, willingness to pay and cost recovery. The review focused particularly on the debate about whether or not to use DRA techniques and the application of the "water as an economic good" concept to WATSAN projects and programmes. Much of the WATSAN literature of the 1990's was taken up with these kinds of debate.

Since 1999, however, there has been a proliferation of interest, particularly from the Work Bank, on issues relating to investments in infrastructure services, regulatory polices, private sector participation and their combined effect on the poor, especially in peri-urban and rural areas. Literature reviewed from the later 1990s and 2000 onwards reflects these themes, which are now often at the forefront of the WATSAN debate.

There has also been output and follow up to the World Water Summit in the Hague, September 2000, which heralded the beginning of a return to a discussion about social entitlements and subsidy in the WATSAN provision debate. Other issues, such as water supply within a livelihoods context, and the emergence of the concept of output-based aid, and its relevance to WATSAN delivery in rural areas, have also emerged during the research period.

Each of these issues is reflected to an extent this review.

It should be stressed, however, that we do not consider our literature review to be comprehensive or the last word, but simply to be viewed as a useful text that highlights the main directions where the literature suggests the cost recovery debate in WATSAN projects should now be heading.

The review has been structured along the following lines.

Firstly, an overview of the key issues in relation to the debate about cost recovery in WATSAN projects has been undertaken. This looks to review some of the definitions of (financial) sustainability in the WATSAN sector and to summarise the thoughts and statements presented on issues of cost, payment and financing.

Secondly, the review looks at demand assessment for WATSAN projects in more depth - where does the literature suggest demand assessment should occur in the project cycle, what methodologies are best for demand assessment.

Lastly, the review looks at the approaches for recovering costs in WATSAN

projects and programmes. It is divided into a review of tools (tariffs, subsidies, micro-finance initiatives) and models (decentralisation, private sector participation, community-based organisation, pro-poor regulation, output based approaches and livelihoods approaches).

1.2 *COST RECOVERY AND FINANCIAL SUSTAINABILITY*

1.2.1 *Interpretations*

Our review identified a range of interpretations on the challenge that cost recovery and financial sustainability presents WATSAN projects. For example:

- DFID - Financial sustainability requires that the system is at least able to meet its capital, operating and maintenance costs to ensure that WATSAN services and interventions continue to operate satisfactorily and generate benefits over their planned life.

- Business Partners for Development – The costs associated with WATSAN projects include the cost of providing infrastructure; the cost of connecting a household to the system; and the cost of operating and maintaining the system. While cost recovery is important for sustainable project delivery, it cannot be looked at in a vacuum. Sustainability in WATSAN projects is multi-faceted – technical, institutional and financial sustainability are all important. The cost recovery challenge for any project is to find the right balance between these elements - a service that a household wants, is willing and able to pay for and does pay for; and an operational and institutional system that is capable of collecting these contributions.[1]

- IRC[2]: The key factors contributing to sustainable cost recovery in WATSAN projects and programmes, can be subdivided into seven categories:
    - Setting a strategy
    - Improving willingness to pay
    - Optimizing costs
    - Establishing clear financial responsibilities
    - Setting an appropriate tariff
    - Improving access to alternative finance
    - Organizing effective financial management

- Danida[3]: Successful cost recovery is a key component in the attainment of sustainable water supply services. All improvements require money and

(1) Business Partners for Development November 1991: Cost Recovery - Partnership Frameworks for Financially Sustaianble Water and Sanitation Projects; Linda Stalker Prokopy and Krisitn Komives.
(2) Seven Key Factors for Sustainable Cost Recovery in the context of community - managed water supply. François Brikké and Johnny Rojas. IRC Occasional Paper. December 2000, IRC International Water and Sanitation Centre, Delft, The Netherlands
(3) Understanding the Cost Recovery Challenge: A Study of Ten Rural Communities North West Province and Northern Province, July 1998. A DANIDA Report for the Department of Water Affairs and Forestry South Africa. Hilary Syme and Frank Snijder

other resources, not only for the initial infrastructure, but also for recurrent costs such as operation, maintenance, repairs and replacement.

- Water Aid[4]: The ability of a community to keep a water point operational over a long period of time is a complex mix of managerial, social, financial, and technical issues and the capabilities of the institutions and infrastructure designed to support the community. To make matters more complex, each of these elements are often inter-linked and inter-dependent.

- World Bank[5] – The principles of cost sharing and community responsibility for meeting capital costs, operational and maintenance costs should be clearly spelled out from the outset. The cost sharing arrangements negotiated should depend on the level of service for which the community is willing to pay – the higher the cost of service, the greater the community share. Special emphasis should be placed on responsibility for sustaining investments. Rules should be spelled out about asset ownership, operation and maintenance and ongoing recovery of capital cost.

Three core issues emerge from the range of interpretations on cost recovery we looked at.

1. Firstly, that at least operation, maintenance, replacement costs should be recovered to be financially sustainable, but ideally part payment of capital costs should take place too. One off subsidies are tolerable.

2. Secondly, local institutions, policies and a people-focus are as important as the level of charge in order to achieve cost recovery in a WATSAN project; and

3. Thirdly, that some form of demand assessment and financial assistance can help in the setting, and repayment, of the correct level of service charge.

1.2.2 *Conceptual Approaches – DRA versus entitlements*

Until the 1990's and UNCED, the review found that need, especially in relation to health, tended to be the chief criterion for matching communities to WATSAN projects. Historically, technologies were supplied by donor agencies on the basis of assumptions made about consumer's preferences. However, from the mid 1990's onwards, project implementation in the water and sanitation sector started to reflect the principles established at the *International Conference on Water and the Environment held in Dublin in 1992* and subsequently endorsed at the *Rio de Janeiro UNCED Conference in 1993.*

(4) Assessing Sustainability - The Sustainability Snap Shot, Steven Sugden, Water-Aid Malawi.
(5) Managing Water as an Economic Good – the transition from supply orientated to demand responsive services, Mike Garn, World Bank 1998.

These core "Dublin Principles include the following.

- Effective management of water resources demands a *holistic approach* linking social and economic development with protection of natural ecosystems.
- Water should be recognised as having an *economic value* in all its competing uses.
- Water development and management should be based on *a participatory approach,* involving users, planners and policy makers at all levels, with decisions taken at the lowest appropriate level.

A further condition attached to the Dublin Conference refered to *the provision of a minimum amount of water at an affordable price.*[6]

Although the pronouncements of the Dublin Conference on the treatment of water as an economic good did not provide a consensus viewpoint among water analysts about the definition of the term (see McNeill 1998; Perry *et al* 1997)[7] , the declarations were seen as the start of a conceptual framework upon which to think about financial sustainability in WATSAN programmes.[8]

Thus, and subsequent to the Dublin Declarations, many publications, conferences and debates occurred, which discussed the implications of treating water as an economic good. [9]

Importantly, in 1998, the World Bank produced a note entitled "Managing Water as an Economic Good", by Mike Garn.

In this note, the concept of a Demand Responsive approach (DRA) was put forward. DRA was an approach to WATSAN that attempted to respond to consumer demands and which aimed at making projects more sustainable than supply-driven approaches. Garn listed the following as key characteristics of DRA:

- Community member make informed choices about:
  - whether to participate in the project;
  - levels of service, based on willingness to pay;
  - when and how their services are delivered; and
  - financial management and management of O & M;
- Governments play a facilitative role;
- An environment enabling private (and NGO) participation is created; and
- An adequate flow of information is provided to the community.

(6) See International Conference on Water and the Environment, 1992; Briscoe 1997

(7) McNeill, D. (1997) Water as an Economic Good, *Natural Resources Forum*, vol. 22, 4, pp 253-261; Perry, C., Rock, M. and D. Seckler (1997) Water as an Economic Good: A Solution, or Problem? In Key, M. Kay., T. Franks and L. Smith (eds.) (1997) *Water: Economics, Management and Demand,* E&FN Spon.

(8) J. Winpenny, 1997; Carter et al, 1998

(9) For example, J. Winpenny (1994) *Managing Water as an Economic Resource;* Routledge; M Kay, T Franks and L Smith (eds) (1997) *Water: Economics, Management and Demand,* E&FN Spon.

Garn also suggested that in order for DRA to work effectively there needed to be competition among communities for funding, in order to decide whether to provide support to a particular community and what type of system and level of service to provide.

For many NGOs, however, this competitive aspect of the DRA debate was fundamentally flawed - how could poor communities compete and pay for WATSAN projects? To these stakeholders, DRA represented the problems that seemed inherent to them both in declaration to "treat water as an economic good", and in the methods for finding out how much people were willing to pay, such as contingent valuation. For proponents of the DRA approach, however, entering into this debate was seen as critical in order to move the sector away from the minimum level of service, supply orientated approach reliant on affordability rules of thumb, which Garn criticised.

The extensive empirical research conducted by The World Bank between 1987 and 1990 was used to back up the DRA argument.[10] This study found that household income, though often important, was not the overriding determinant of demand for improved WATSAN services. The following three factors (in no order of importance) were found to be significant:

- socio-economic characteristics: household income, gender, education, occupation and assets, among other local demographic characteristics;

- characteristics of supply: the relative merits of the proposed water supply (over the existing source), particularly relating to cost, quantity, quality and reliability; and

- households attitudes towards government policy in the sector and towards other organisational representatives with whom local citizens deal.

However, despite this debate, there remained little practical agreement (or conclusive evidence) indicating how sustainable cost recovery strategies could be ensured over time for WATSAN projects, or how they were to be defined. Conceptual camps tended to emerge between the DRA/ World Bank approach to WATSAN and the more "rights-based" approach to WATSAN.

The second World Water Forum was held in The Hague in March 2000. Partly as a result of the debate between the DRA and rights-based camps on WATSAN, among many other issues, the debate and the subsequent Ministerial Declaration on Water for the 21st Century was slightly different to that of the Dublin Declaration. It stated, on valuing water:

"to manage water in a way that reflects its economic, social, environmental and cultural values for all its uses, and to move towards pricing water services to reflect

(10) Demand for Water in Rural Areas: Determinants and Policy Implications. Briscoe et al, World Bank Research Observer, January 1993.

the cost of their provision. This approach should take account of the need for equity and the basic needs of the poor and the vulnerable."

And on meeting basic needs:

"to recognise that access to safe and sufficient water and sanitation are basic human needs and are essential to health and well-being, and to empower people, especially women, through a participatory process of water management."

There is a clear shift away from the DRA agenda in the statements from The Hague, toward a more rights based approach for WATSAN delivery.

The third world water forum will be held in March 2003 in Japan, where again this issue will no doubt be re-visited, however, it does seem that the findings and arguments that the DRA agenda put forward in the late 1990's remain pertinent to the cost recovery debate and could provide part of the solution, when one is trying to identify "what works" vis-à-vis financially sustainable WATSAN projects and programmes.

1.2.3 *Demand*

Poor people can pay

There are many sources of information on the range of water demand curves that exist for consumptive uses. The literature agrees that, in reality, several different demand curves could exist for different water uses within and between households. To derive a demand function (or series of functions) from observed data for all of these uses would be a very difficult exercise to undertake given the time and resource limitations for any standard project feasibility study. Instead, in general, a *log linear functional form is assumed for the demand curve for water.* This implies that the price elasticity of demand for water is a constant at all levels of water use within households. Although this is at best a crude representation of household water demand behaviour, it allows economists to provide a reasonable approximation of people's actual demand behaviour. [11]

This is an important assumption, as it suggests that WATSAN designers should assume that demand for water is related to income for the poor. However, as the World Bank found, household income, though often important, was not the overriding determinant of demand for improved WATSAN services. A log linear relationship between demand and price/ cost for water, therefore, may be a misleading oversimplification.

Conversely, there are many, many references to both the willingness of poor people to pay for WATSAN services, and the often-costly coping strategies that they endure to access WATSAN services, as evidence of the fact that they

[11] Dale Whittington and Venkateswarlu Swarna "The Economic Benefits of Potable Water Supply Projects to Households In developing Countries. Asian Development Bank, Economics and Development Resource Centre. January 1994.

often pay high prices. Literature from the UNDP-World Bank Water and Sanitation Programme provides a good overview of both these issues.[12]

Productive uses of water are important

Attention has also turned to looking at peoples *productive uses* of water as well. These uses can range from vegetable gardens, cattle farming activities to traditional beer making activities. Surveys conducted in villages in South Africa on the uses of water, indicate that there is a high economic value for water (up to 40 litres beyond the basic consumption level), which is accounted for mostly by productive, or economic activities. Other work has found that the daily per capita amount of water used for productive activities is more than double in villages with better access to water supplies. And importantly, the sustainability of the system depended on these demands being met. [13]

In general, the most highly rated benefits are water reliability and water security.[14] These benefits can be of particularly high value if they are seen in relation to the scheme's perceived usefulness to assist in other income generating activities within the household. [15] Combined with this, is the ability to provide capacity for all consumption uses into the future - ie to meet *future* as well as present demand. Often more people will return to a village or a region, if the water sources become more reliable. Conversely it has been found that water shortages or unreliability of service will, not surprisingly, decrease the rate of payment for water services.[16]

1.2.4 *Demand assessment.*

The literature generally sees demand assessment as crucial for the correct determination of consumer preferences.[17] If it is assumed that consumer preferences are a function of costs, other variables and varying qualities and quantities/levels of water and sanitation provision, then it is important for demand to be assessed accurately as unsatisfied demands for water and sanitation provision can make a project unsustainable.[18] Importantly the literature also suggests that demand assessment may highlight the need for a *mixed level of service*, to reflect both users differences in demand, and seasonal variations in geophysical conditions.[19]

(12) Willing to pay, but Unwilling to Charge. UNDP-World Bank Water and Sanitation Programme South Asia, 1999; Water Resources Policies and the Urban Poor; Innovative Approaches and Policy Imperatives, Bhatia, Ramesh, Falkenmark and Malin, Water and Sanitation Currents UNDP-World Bank Water and Sanitation Programme, 1993.

(13)J.C.Perez de Mendigueren, WEDC Conference, 1998

(14) Garn, M. (1997) Managing Water as an Economic Good, paper posted at: http://www.oneworld.org/thinktank/water/index.html.; World Bank Water Demand Research Team, World Bank Research Observer, 1993 pp47-70

(15) (Waughray et al, 1999; B. Rihardjo and D. O'Brien, 1994

(17) J. Briscoe, 1996; Carter et al, 1999; World Bank-UNDP Community Water Supply and Sanitation Conference, 1998.

(18) J.C.Perez de Mendigueren, WEDC Conference, 1998

(19)M. Webster, WEDC, 1998

(20)B.Copeland, WEDC Conference, 1995; J.C. Perez de Mendigueren, WEDC Conference, 1998

The World Bank Global Study on Water and Sanitation found that, although technology choices should be linked to prices so that communities understand how their payment is determined, most projects, which were reviewed, *did not* make this link explicit. The result was that many household members perceived their contribution as a tax. This World Bank study also revealed that it is important to give communities follow up information on project management, especially operation and maintenance so that they can understand the level of tariffs. In many cases, therefore, it seems that communities *do not* perceive that they face an economic trade-off for a higher level of service. And it is exactly this issue that demand assessment aims to resolve.

A key finding of the literature review is an identification of a difference between notional and effective demand, and how this may help to improve the use and understanding of assessing demand to design more sustainable WATSAN projects and programmes.

Sen (1981) illustrates effective demand by considering a shop selling food in a famine area, where many people cannot afford to buy the food. The need for food is great, but only a few people can buy it, therefore, effective demand for food is small [20].

Pearce (1981) defines effective demand as the "aggregate demand for goods and services which is backed up with the resources to pay for them.....distinguished from 'notional demand' which refers to a desire for goods and services" [21]

Credit or other financial assistance and the type of payment structure on offer, can help to translate notional into effective demand, rendering affordability or rule of thumb analyses less useful. These differences may be of central importance to the WATSAN debate on financial sustainability.

For example, for poor people in rural / peri-urban areas, the marginal utility of money is high (people value hard cash highly), incomes tend to be low or insecure, and often people pursue a wide range of livelihoods whereby their wealth is tied up in a number of assets, and not just in disposable income. A large part of the literature (especially Government policies) has therefore focused on the fact that poor people cannot or should not pay for WATSAN services. However, many studies have also shown that poor people do in fact, often pay a high price to access WATSAN services, just to cope. A range of other studies have also suggested poor people are willing to pay for improved WATSAN services. And there are also many examples of rights-based WATSAN projects, which have found that innovative ways of paying for water such as through savings groups, revolving funds etc can be useful - the way the payments are designed can also influence how much people will pay.

[21]R. Carson 1999. Contingent Valuation; A Users Guide.

These studies seem to be contradictory. Rural /peri urban people are poor and value their cash greatly. They have to pursue many strategies to survive. And yet they will still pay a lot for water in relation to their income, or will be influenced to pay by project designs, contrary to what an affordability study may have suggested.

Hence in theory, the effective WTP of the consumer can be fixed, but if they have access to other assets (labour, livestock, credit, savings schemes) and if the design of the project particularly suits them, then their notional demand may be quite high. If the right mechanism can be designed and implemented to translate their notional into effective demand for WATSAN services, therefore, then they will be willing and able to pay beyond their observed and immediate income constraint.

Is this what successful, demand focused WATSAN projects and programmes have done to deliver financial sustainability?

1.2.5 *Methodologies for demand assessment*

Demand assessment methodologies can be classified into:

- *direct methods* such as the Contingent Valuation Method (CVM), and
- *indirect methods* such as the observation of existing payments for, or efforts taken to obtain, water services (revealed preference studies).

Carson 1999 has recently provided an accessible users guide to CVM.[20]

Whittington 1994, provides a clear methodological guide for using indirect methods, particularly revealed preference techniques - the costs savings benefit approach - for measuring the demand for water.[21]

However, in terms of *directly* assessing community preferences, the literature debates whether CVM, or the use of participatory community meetings, are the most practical or accurate method available. There are only a few studies that compare CVM results with *actual* behaviour and none were found which compared the results of community meetings with actual choices. In a study that looked at WTP results using both CVM and participatory meeting techniques, there were significant differences in the socio-characteristics of the samples. This can lead to significant differences in policy conclusions.

Furthermore, historical, socio-economic and cultural factors may also compromise the ability and/or willingness of rural people to engage in CVM exercises. In addition, the time and resources needed for a contingent valuation survey may not always be appropriate for small community projects.

(22) Dale Whittington and Venkateswarlu Swarna "The Economic Benefits of Potable Water Supply Projects to Households In developing Countries. Asian Development Bank, Economics and Development Resource Centre. January 1994.

The literature suggests that the advantage of community meeting techniques is that the additional discussion generated by groups of individuals should increase the quantity and quality of information available to those participating. This additional information should reduce the hypothetical bias associated with CVM. On the other hand, there is also a debate that the threat of strategic behaviour might increase during community meetings if participants realise that they might benefit from exaggerating or mis-stating their preferences.

DFID also recommends the following demand assessment techniques, which can be used:

- Participatory Rapid Appraisal (PRA) facilitated by community members (for low cost, low-tech options).
- PRA facilitated by a trained researcher (suitable for most technologies and can be complemented with other approaches).
- Revealed preference approaches are suitable where substantial water problems exist, in conjunction with PRA models.
- CVM can be used for informal strategic decisions on level of service; cost recovery policy and large investment programmes.
- The 'Benefits transfer' approach, under which results in one location are used to estimate benefits in a 'similar' location is *not* recommended.

DFID recommend that a choice of technologies and associated prices should be given to communities. However, this may miss the capture of notional demand from the community, and in essence, remain essentially a supply side orientated design process, whereby the change agent (DFID) decides upon the community's demand for a variety of service options.

We note in passing that the demand assessment literature draws heavily on developments in the field of environmental economics. A recent methodological evolution in environmental valuation with relevance to demand assessment in developing countries is the use of a technique called contingent ranking. This direct approach differs slightly from contingent valuation in the use of option packages that are ranked by respondents rather than the statement (or rejection or acceptance - depending on the question format) of a willingness to pay value. The option packages in the context of water/sanitation supply would consist of a matrix of service or supply attributes (e.g. communal, yard or private connections), levels of service and an associated price or tariff associated with each combination of attributes a respondent might select.

The contingent ranking approach draws heavily on the conjoint analysis method used widely in marketing studies to launch a new product with appropriate "demand driven" attributes. We suggest that this method could be part of any social marketing study to both raise awareness of the benefits of supply options, *and* make explicit the price/level of service tradeoffs households and communities must consider. To date no applications of this approach are available.

However, the most challenging part of the demand debate seems to be not so much on the ways of assessing demand in theory, but on how to implement the policy in practice, so as to design financially sustainable projects, in a cost-effective manner.

1.2.6 *Using demand assessment to design cost recovering projects*

IRC carried out some recent research to identify key factors that contribute to sustainable cost recovery in the context of community managed water supply services. The seven key factors for sustainable cost recovery are briefly highlighted below (Brikke & Rojas, 2000):

- The community should be assisted to set a clear strategy for cost recovery that articulates the concepts of equity, efficiency, participatory process and capacity building.
- Factors influencing Willingness-To-Pay (WTP) for water services should be identified and improved upon accordingly. It is a prerequisite that the WTP should be estimated as accurately as possible.
- Costs of water supply services should be optimised through a process of identifying, estimating and analysing the costs, choosing appropriate technologies and service options that are affordable to low-income communities, establishing the optimal cost recovery level and minimising operation and maintenance costs.
- Financial responsibilities for the community and other stakeholders should be clearly specified, well documented and distributed to the relevant stakeholders.
- The scope of a tariff should be established and an appropriate tariff set.
- Alternative sources of funding for community water supply schemes should be explored to supplement cost recovery through water tariffs. Possible alternative sources include community financing, private or co-operative funding, targeted subsidies, general water levies, soft loan mechanisms and grants.
- Developing an effective financial management system through effective budgeting, billing, revenue collection, bookkeeping, financial monitoring and control. These elements can be strengthened through capacity building of the responsible members of the community.

These seven steps broadly concur with earlier suggestions as to the key variables that determine whether demand assessment leads to sustainable financial projects:

- Tackling affordability and associated income generation issues, as well as identifying effective demand;

- The methodology used to elicit willingness to pay values and the translation of demand assessment information into design and tariff decisions;

- Demand variances within the community; and

- The financial management capacity of the community.[22]

And DFID's guidelines do not differ significantly from these same general viewpoints concerning critical factors for financial sustainability of WATSAN projects. DFID criteria include the following:

- Understanding local priorities and preferences for water and sanitation services, as well as formal and informal power structures;

- Providing different (or at least flexible) levels of service and technologies according to the different willingness to pay amounts of the community;

- Setting charges for services at levels which generate sufficient income to cover operation, maintenance and replacement costs;

- Enhancing hygiene promotion programmes to stimulate demand for water supply, sanitation and waste disposal facilities;

- Ensuring that the correct financial and technical training is given to the community;

- Ensuring that the technical, institutional and budgetary needs of consultation and decision making are catered for in the planning, design and implementation phases; and

- Enabling private sector agencies to offer support services where this is more efficient than public sector.

1.2.7 *Occurrence of demand assessment in the Project Cycle*

At the earliest stage in the project cycle, most agencies identify their WATSAN projects from country sectoral strategy and country programmes.

The review then found that many development agencies agree that the identification of specific communities for water and sanitation provision may be the most important step to project design. [23]However, the issue of identifying demand to ensure financial sustainability tends to be side-stepped slightly, and instead appropriate communities the agency or organisation can

(23) B. Ruhardjo, D. Brien, 1994

"work with" are identified early in the project cycle -perhaps at the pre feasibility stage. For example, indicators that can influence the selection of communities which projects can "work with" are leadership, organisation capability, and successful completion of other community projects. [24]

In this instance, demand assessment does not play a role in identifying the demand for agencies projects; instead the onus is on finding communities the agency can effectively "work with", or finding implementing agencies (often NGOs), who can liaise between the agency and the community.

However, some examples also exist where affordability analyses, or in some cases willingness to pay studies, have been used to select communities at an early stage in the project cycle. They include the following.

- In a World Bank-UNDP project the financial policy gives priority to those communities paying more than the minimum 20 per cent of the capital cost. The level of community contribution is higher than the requirement of 20 per cent and the average has been 28 per cent.

- The Mvula Trust, independent organisation providing water and sanitation services in South Africa, identifies communities to work with by requiring that communities demonstrate their organisational capacities. Before Mvula commits to funding the project, the community must put together a feasibility study. An up front contribution is required from the community.[25]

- The Rural Water Supply and Sanitation Transition Demonstration Project, largely funded by DFID, requires that communities initiate their own proposals which specify the level of service they want and for which they would be willing to pay. The proposals are assessed on a competitive basis, employing criteria, which establish minimum conditions which must be met but which allow communes to 'bid-up' their proposed contribution.

- Current joint policy in Vietnam between UNICEF and CERWAS for water and sanitation projects (a Vietnamese government body for water and sanitation) stipulates that communities must contribute 20 per cent of the capital costs of their water systems. On a pilot basis communes have repaid 100 per cent of capital costs in regular instalments over a number of years.

- A water and sanitation project run by CARE selects communities on the basis of willingness to pay and ability to pay.

In general however, although there is a consensus as to the usefulness of measuring peoples demand for WATSAN projects, there seems to be little

(24) ibid.

(25) World Bank-UNDP Water Supply and Sanitation Conference

agreement on how and where in the project cycle demand assessment techniques should be used.

DFID states that demand assessment is important at both the policy stage of the project cycle and at the project identification, preparation and appraisal stages. In larger more complex systems, there will be a need to develop institutional capacity for continuing demand responsiveness. Demand assessment should be carried out in the early stages to establish broad parameters of demand to inform strategic design decisions. In later stages of the projects cycle, a more detailed costing will inform tariff structure design decisions.

However, again, the problem seems to be in the rigorous methodological implementation of this policy, rather than in agreeing on the principles behind it.

1.2.8 *Affordability*

Importantly, a World Bank study shows that the sustainability of WATSAN projects depends on whether communities are chosen on the basis of needs or demand. The study suggests that demand is not well correlated with affordability indicators and cannot be well predicted on the basis of income alone.[26]

Some agencies such as the Asian Development Bank [27] and DFID recognise that the 5 per cent affordability indicator (the assumption that people would be willing to pay 3 to 5 per cent of their income on water) is arbitrary and recommend that affordability studies be put in the context of how consumers currently cope and what they pay for water.

In general, the literature shows that willingness to pay (WTP) has proven to be a more successful indicator of demand than ability to pay. For example, a WTP study in Nigeria reports WTP values that are 18 per cent of incomes for rural low-income households.[28] Some studies have shown higher WTP for poorer households, compared to a standard of around 2 to 3 per cent of spent on water services among high-income households. These results indicate that rural communities may prefer service levels above the minimum often prescribed and that rural or peri-urban water and sanitation projects may not actually require extensive government subsidies.

The literature suggests that the reliance on ability to pay studies derives from the fact (or belief) that WTP analyses, with their preference for using hypothetical markets, ignore the actual financial constraints the household faces. Further, WTP by women in particular may not be even close to their

(24)Mike Garn, The World Bank

(25)(Water and Sanitation Project Guidelines for Assessment

(28) D. Wittington et al, 1991

ability to pay, because of their lack of control over household incomes. [29]Also, the pro - affordability lobby suggest that the unreliability and variation in household income are important in determining the affordability of water and sanitation systems. Consequently, flexible water services such as seasonal water vending systems are seen as better able to suit situations where incomes or resources vary over time. [30]

However, the debate about the need to identify notional demand through the use of WTP or other community-based studies remains a persuasive one, in order to break the cycle of low levels of supply orientated service, and low expectations. For, although it remains common for subsidies to be given to cover the difference between notional demand and affordability (if notional demand has been identified), other more sustainable approaches to help meet effective demand are emerging in the literature, such as the linking of income generation activities or the use of micro credit, as components that can create more demand orientated and sustainable water and sanitation projects.

DFID's policy on affordability, however, is slightly contradictory in relation to its encouragement to assess demand. Although it agrees that affordability "rules of thumb" have been shown to be a poor guide to WTP for WATSAN service improvements, it does suggest that affordability should be interpreted on a case-by-case basis. Hence, the identification of notional demand for WATSAN services is potentially subsumed by the recommendation to explore more affordable (and therefore supply orientated) options for the community.

1.3 *APPROACHES FOR RECOVERING COSTS*

This section of the review is divided into a review of tools (tariffs, subsidies, micro-finance initiatives) and models (decentralisation, private sector participation, community-based organisation, pro-poor regulation, output based approaches and livelihoods approaches)

1.3.1 *Tariffs*

In general, the literature agrees that an efficient tariff policy should be one that reflects the marginal economic costs of supply.

The literature also agrees, however, that tariffs can also commonly be used as instruments of social policy, such as the redistribution of income based on equity concerns. For example, connection fees can be kept low to prevent entry being deterred and often charges can be subsidised for some period. [31] A commonly observed approach in urban environments in developing countries is to use a tariff schedule that consists of a low subsidised "lifeline" rate for the first 6-8 m^3 per month, and a higher rate for all additional consumption. More complex tariff schedules with multiple increasing blocks, sometimes in proportion to the recorded income distribution of the country,

(29) B. Evans, WEDC Conference, 1996

(30) D. Wittington et al, 1989, 1990

(31) J. Winpenny, 1997

are also relatively common. (32)(33) However, some literature suggests that water utilities are likely to find it difficult to limit the size of the initial block for residential users due to *political pressures*. Data from the Asian Development Bank shows that the first tariff block is nearly always set for a larger quantity than is dictated by basic water needs. [34]

The problems associated with pricing water of rural, agricultural [35] and peri-urban areas are highlighted by an IRC-UNDP project that assessed how far the Dublin principles had been followed. The study showed that progress with tariffs in line with the Dublin principles is greatest in urban areas where metering is more common, compared to other contexts, where the consumer base is more difficult to define. [36]

However, and as mentioned already, since most water is consumed by relatively small number of consumers (large residential, commercial and industrial users) a marginal cost based price for all consumption over than required for basic health purposes would generally be an efficient, equitable and financially viable policy. [37]

Where metering is possible, the literature seems to concur that a two part tariff is an improvement on increasing block tariffs as it can achieve the intended income distribution element required and eliminate the within-block regressivity of an increasing block tariff. The first part is a capacity charge that determines a user's maximum usage during periods of excess demand plus any other fixed costs The second part is a usage price equal to marginal cost. The two part tariff confronts most households with the full marginal cost of supply. (38)(39)

Optimal designs for water tariffs will of course vary with the varying nature of water resources. Where the opportunity cost of water resources is low (demand is below supply, currently and in the future) the fixed costs of water system are high compared to the variable costs. The costs of metering and usage based billing are thus high compared to the cost of water and meter installations may not be worth the cost. However, for those areas where the opportunity costs of water resources are high, metering is more likely to be worth installing. [40]

In order to satisfy equity and financial objectives, it is generally recommended that communal standpipe users be charged a tariff linked to the operation and maintenance of a basic level of service (also considering affordability) and

(32) J.J. Warford, 1997
(33) J.J. Boland, D. Wittington, 1997
(34) Ibid.
(35) It is estimated that 91% of total water consumption in developing countries is used in agriculture. (fin 4)
(36) http://www.irc.nl/home/wrmp/wrmpdc01.htm
(37) J.J. Warford, 1997
(38) J.J. Boland, D. Wittington, 1997
(39) R. Noll et al, 1999
(40) Ibid.

individual connections be charged the average incremental cost of the operation and maintenance, depreciation and capital cost of supply. [41]

Some commentators argue that a more holistic approach to water supply and sanitation - using an integrated water resource management policy for example - may be a more productive way to build truly sustainable financing strategies into peoples water tariffs, because user charges for water often do not currently include a pollution cost element. [42]

DFID suggests that the use of cross subsidies, lifeline tariffs and rising block tariffs are all part of the same strategy to include equity objectives into cost recovery. In addition, water connection costs can be eased for low-income households by subsidising the costs or allowing the connection fee to spread over a longer period.

1.3.2 *Subsidies and micro finance*

The review found that, although there is widespread agreement that users must be responsible for operations and maintenance, [43] there might be circumstances where subsidies are acceptable. For example, there may be conventional economic reasons for subsidising water or sanitation services, such as the presence of external health benefits, which may be compounded by a lack of awareness of health issues.

Consumers may not value water quality highly enough because of information imperfections relating to, for example, the relationship between water quality and health. With low awareness levels consumers may respond to higher prices for piped water by consuming too much low quality water from other sources. Some development agencies propose to correct this by subsidising some minimum amount for human consumption. The need to subsidise consumers may also be indicative of a wider problem regarding, for example, price reforms.

In fact, the literature suggests that there are many reasons why water and sanitation suffer from price distortions. Commonly, treating water and sanitation as social instruments for the wider objective of rural development or alleviating macro-economic inefficiencies may lead to the *second best problem*. [44] If inefficient conditions prevail in other areas of the economy, for example, the price of labour is below its economic cost, then consumers are not able to pay for water. National priorities on food security may lead to inefficient water pricing practices for the agricultural sector. In most developing countries, for example, charges for irrigated agriculture have been much lower than those required even to pay for operation and maintenance. [45]

(41) G. Yepes, 1999
(42) B. Evans, WEDC Conference, 1996
(43) The World Bank, 1999
(44) J.J. Warford, 1997
(45) J. Briscoe, 1996

Consequently, the review found that few rural finance schemes are thought to be fully self-sustaining and organisationally sustainable, and an external subsidy may often be needed to cover training, administration and start up (capital) costs. [46]

Furthermore, the review found that the subsidy ceiling can be the most critical element of a sustainable financial policy.[47] The per capita ceiling on capital grants has been instrumental in ensuring sustainable financial rules in the Mvula programme. Conversely, perverse incentives may occur with expressing subsidies as a percentage of the capital cost of each option. The option with the highest subsidy may be chosen on the basis of it being the biggest capital contribution to the community. [48]

In peri-urban areas, the review found that cross-subsidisation policies can fail to provide incentives to the utility to bill or collect from many users at the low end of the tariff spectrum, thus aggravating cash flow problems. In fact, social tariffs may create disincentives to expand services to low-income areas. [49] Unrealistically high rates to industrial and commercial users can force them to look for alternative supplies, thus reducing market share and, in the process, exacerbating the cross subsidy problem. [50]

In relation to lifeline or rising block tariffs, the poorest often have to obtain water through shared connections, from neighbours with connections or from water vendors. If several households use the connection the group quickly exceeds the volume in the initial block, pushing water use into the higher priced blocks. This problem occurs also with water re-sales from households with private meter connections from water vendors. Under such pricing policies, the poor may pay as much as 30 per cent of their income for water, while wealthier households pay less than 2 per cent. [51]

However, it also appears that a reliable correlation between water consumption and household per capita income is difficult to establish and there may be, in fact, more efficient ways of redistributing income than through water supply tariffs. Since most water is consumed by a relatively small number of consumers (large residential, commercial and industrial users), a marginal cost based price for all consumption over that required for basic health purposes would generally be an efficient, equitable and financially viable policy. [52] Alternatives to subsidising water tariffs in peri urban areas, therefore, could be the use of marginal cost pricing for water plus a cash subsidy for the poorest, which is unrelated to water use. [53]

(46) Overseas Development Institute, 1997

(47) P. Dean, G. H. Khohar, WEDC Conference, 1998

(48) World Bank Water and Sanitation Conference

(49) World Bank Private Sector Note 188

(50) G. Yepes, 1999

(51) World Resources Institute,

(52) J.J. Warford, 1997.

(53) Ibid.

However, it is also important to know the total cost of the intervention for which the subsidy is partly given. The IRC suggests that a low cost intervention and a subsequently low subsidy per household are important pre requisites for system sustainability. [54] How this finding relates with the need to try and access people' s notional demand, however, is not clear. The solution may lie in the terms of any additional credit given to the user, to help pay back a loan for a WATSAN intervention.

This ties in with other current research on subsidies, which indicates that where a government decides that a subsidy is appropriate, then it is usually preferable to subsidise access to a service rather than consumption.[55]

DFID's approach to subsidies for water supply schemes is that they should be justified on income redistribution grounds, and not on direct health benefits. DFID suggests that subsidies for sanitation may be needed to correct for 'market failures', which arise because inherent demand does not lead to the level of investment in those sanitation services which would be most efficient for the economy and society. This policy, in fact, reflects the argument stated earlier for identifying the notional demand for WATSAN services, and then finding a viable selection of financing instruments to help the community pay for them. However, in this case, DFID advocates the use of subsidies at present.

Sanda and Oya suggests that better access to micro-credit should reduce the gap between service affordability and consumer's WTP and help low-income households afford the longer term options. However, designing an appropriate incentive compatible form of credit scheme seems to be instrumental in stimulating disadvantaged groups to initiate income generation activities and to enhance their group solidarity.[56]

Some practitioners in the water and sanitation sector believe that sustainable financing strategies for WATSAN projects actually require the complementary development of micro-credit and savings mechanisms to build a source of financing to pay for improved levels of services and operation and maintenance - that the financing issue should be considered in the wider context of poverty eradication, for both sanitation and water services. [57] These practitioners feel that credit binds people to repayment and leads to growth and sustainability of the system. [58]

This seems like a centrally important point that can link the issue of capturing notional demand to the design of a reasonable standard of WATSAN service supply, which can become financially sustainable.

(54) International Water and Sanitation Center (IRC)

(55) *Tariffs and Subsidies: Chapter 5: New Designs for Water and Sanitation Transactions, upcoming World Bank publication 2002, ed. Barbara Evans.*

(56) K. Sanda, K. Oya, WEDC Conference, 1998

(57) B. Evans, WEDC Conference, 1996;

(58) World Bank-UNDP Community Water and Sanitation Conference

DFID's position on this area, however, is relatively weak. The closest DFID policy statement this review could find on the linkages between credit and meeting the effective demand for WATSAN services, comes from the 1998 Guidance Manual. It suggests that demand assessment studies can help in the design of payment mechanisms that are appropriate for poor people. They can identify, for example, people's preferences for weekly as against monthly payments, or for credit arrangements to spread over time the capital casts of connection fees.

1.3.3 *Decentralisation and regulation*

The survey found that there is an increasing realisation that governments must make the transition from being a 'provider' of services to becoming a 'facilitator'. National agencies should be responsible for finance, long term planning, standard setting and technical assistance. Compatible legal frameworks and a clear division of responsibilities and mandates within the water and sanitation sector are needed.[59] Well-defined contracts and an appropriate level of regulation are also needed to ensure efficient operations by the private sector.[60]

Although the survey found that private sector participation could also assist in the provision of demand driven services[61], it now appears clear that specific attention to the needs of demand driven services for poor people should be explored from the outset of contract and regulatory framework design. If this does not happen, then there is a risk that the resulting regime actually creates further barriers to the provision of such services.[62]

For rural areas, many water sector studies recommend that the only sustainable manner of managing water supply and sanitation is for community management models to manage their own water and sanitation supply systems.[63] However, this can be difficult in cases where the legal and regulatory frameworks have not formalised the status of such organisations. This can create very practical difficulties for such organisations, especially if they are tasked with collection of tariffs and financing of maintenance, without a clear legal entity allowing them, for example, to open a bank-account.[64]

In general, the survey found that the particular management model adopted for WATSAN projects seems to impact significantly on the level of demand. Communities may distrust a national government's capacity to manage the

(59) http://www.who_int/water_sanitation_health; http://wsscc/vision 21/docs/docs27.htm
(60) R. Franceys, WEDC, 1997
(61) N Johnstone and L Wood, 1999
(62) *New Designs for Water and Sanitation Transactions, upcoming World Bank publication 2002, ed. Barbara Evans.*
(63) Katz, T. and J. Sara (1998) Making Rural Water Supply Sustainable, Recommendations from a Global Study, UNDP-World Bank Water and Sanitation Program, posted at http://www.oneworld.org/thinktank/water/index.html . Also From system to service - scaling up community management, 2001, Ton Schouten and Patrick Moriarty, IRC Netherlands
64 ERM research as part of preparation for the World Bank publication "Lessons in Private Provision of Rural Infrastructure Services" financed by the World Bank Public-Private Infrastructure Advisory Facility (PPIAF)

operation and maintenance of water and sanitation projects efficiently, and consequently their demand for such projects decreases. Willingness to pay for investment costs has been found to increase dramatically when communities, rather than government agencies, have control over how funds are spent.[65] The World Bank Rural Water Supply Global study found that per capita costs were lower where there were higher community contributions and when construction contracts were managed by NGOs rather than government agencies.

The literature also suggests that strengthening property rights in illegal settlements can also provide low income households with a greater incentive to switch from day to day purchases to longer term sources of supply. [66] This may also be essential to allow private operators to offer services in such areas, in some cases this is expressly stated in private sector contracts.[67]

Consequently, a review of community management experiences for natural resources (including water) has found that their success seems to depend on four factors associated with the resource and the user group:

- A small and clearly defined resource;
- A close proximity between the resource and users and a high level of dependence on the resource;
- A small and defined group of users, having established arrangements for discussing common problems. Groups must be small enough to ensure good communication and low cost monitoring;
- High noticeability of cheating on arrangements and high costs of 'exclusion' technology.

Also, the more homogenous the community the greater are the chances of a successful common property regime developing.[68] This point was highlighted by a water supply project in Uganda where the size of catchment area (and the heterogeneity of its population) for the project was seen as too large to be sustainable. [69]

In summary, the review found that the types of support needed by communities to help sustain their own WATSAN project management services are:

- Legal and institutional frameworks that recognise community water management groups and provide a clear division of responsibilities;
- Training to develop community capacity for operation, maintenance and financial management;

(65) World Bank Rural Water Supply Global Study, 1998; WEDC Conference 1995; Wittington et al, 1990.
(66)World Bank Private Sector Note No 188, 19991

(67) (Upcoming publication) The interface between Regulatory Frameworks and Partnership Business Partners for Development, Water and Sanitation Cluster, January 2002

(68) B. Evans, WEDC Conference, 1996

(69) B. Copeland, WEDC Conference, 1995

- A strong system for the provision of technical backup. [70]

In relation to sanitation services in particular, constraints to successful implementation in rural and peri-urban situations were identified as: [71]

- The nature of the community (degree of homogeneity, power structures);
- The community's relationship to the government agencies;
- The administration (transaction and co-ordination) costs of intra-community negotiations;
- The administration costs of negotiations between community and government agencies;
- The manner in which willingness to pay for services (demand) is established and how this related to post programme performance;
- The costs of production of services to the community and the government; and
- The evidence of systematic resistance to the partnership arrangement.

1.4 *PRIVATE SECTOR PARTICIPATION*

The literature is generally agreed that public utilities do not have the financial or political autonomy to set tariffs at levels that recover costs.[72] Private sector participation in WATSAN projects and programmes is therefore seen as the most efficient way of ensuring financially sustainable pricing policies[73].

Current research is focusing on how regulatory and legal frameworks, in addition to contracts can be formed so that large-scale private providers of water and sanitation services effectively deliver water services to the poor, whilst ensuring that the sector's financial viability is assured.

The following issues appear to be key[74]:

- The needs of the poor should be central to any private sector reform process;
- The assumption that poor customers are high risk, low return customers should be challenged, which may require a significant information gathering exercise;
- The problems of informal settlements should be directly addressed;
- Innovative ways to address technical problems should be actively encouraged; and
- The distance between the provider and poor customers should be reduced.

Many commentators feel that small-scale private sector (or currently informal) inputs can play a role in resolving some of these issues. If these operators are responding to expressed and identified demand, then in doing so, cost

(70) D. Saywell, A. Cotton, WEDC Conference, 1998
(71) B. Evans, WEDC Conference, 1996
(87) N Johnstone and L Wood 1999
(73) R. Franceys, 1997
74 New Designs for Water and Sanitation Transactions, upcoming World Bank publication 2002, ed. Barbara Evans.

recovery will be *de facto*. For example, recent studies suggest that entrepreneurs in water and sanitation, responding to local conditions and competing for market niches, can offer a wide and flexible range of water supply options - residential re-sales, for example.

In general, the most viable private sector participation options for rural and peri-urban communities are seen as the following: [75]

- *Community contractors.* They can help foster community empowerment and ownership of the project, but do require social development and technical support.

- *Small scale contractors and suppliers.* These agents can help which develop private enterprise in the water sector.

- *Water and sanitation related NGOS.* These organisations can provide social development assistance and the small scale management contracting of systems.

However, it may be difficult to combine the short time scales within which the private sector operator may be required to work, with the longer time-scales that demand lead approaches take. One solution is to formalise the relationships between these small-scale suppliers and the main supplier in the form of partnership, a solution that *the World Bank Business Partners for Development (http://www.bpd-waterandsanitation.org)* has been investigating. In practice, partnerships have shown to offer significant potential, but a whole myriad of problems are still to be resolved if such partnerships are to meet their potential: for example, NGOs and other organisations may simply be unwilling to enter such partnerships with the formality that the private sector may demand, in order to minimise their operational risk.[76]

Further, the literature suggests that developing manufacturing and service industries to support the water and sanitation sector can also assist in financial sustainability. [77]

Participants of the World Bank-UNDP Water and Sanitation Conference agreed that, while for peri-urban areas as many tasks as possible should be delegated to the private sector (and that domestic private investors should be responsible for operation and maintenance in urban contexts), in the rural context public-private partnerships were optimal[78]. In practice, such partnerships may be difficult to establish, rural communities may be satisfied with existing solutions, and may be uninterested to hand-over supply to such partnerships, who they envisage will increase tariffs and cut-off those who cannot pay, particularly where they are established nationally. Other

(75) ibid.

76 . (Upcoming publication) The interface between Regulatory Frameworks and Partnership Business Partners for Development, Water and Sanitation Cluster, January 2002

(77) Carter et al, 1997

(78) World Bank-UNDP Community Water Supply and Sanitation Conference

solutions, such as more locally established partnerships may offer an alternative, however, practical issues concerning friction between geographically close communities, may cause difficulties if private-public partnerships are let at a local level.[79]

DFID's position on private sector partnerships in WATSAN projects, is that success comes from a balanced partnership between the private sector and the government/client and that the regulatory role is crucial. More specifically, they suggest that stand-post supplies may not be effective under a long-term private sector contract, because it is notoriously difficult to collect water charges from a stand-post, but group connections could be a better alternative option.

1.4.1 *Output based aid*

A recent publication on "output based aid" adds to the debate on how to implement cost recovering, financially sustainable WATSAN projects. [80]

This publication argues that traditional approaches to delivering subsidies for public services (in this case WATSAN services) channel the subsidy – whether financed by domestic taxpayers or donors – to the inputs consumed by state-owned service providers, with at best an indirect relationship with the services actually delivered. Affordability concerns are often addressed through cross subsidies built into service prices. The results have often been disappointing. Public sector provision with soft financing frequently suffers from limited incentives for efficiency and innovation, weak accountability for performance, and limited opportunities for leveraging public resources through private sector financing. And cross-subsidies too often benefit the well off more than the poor.

Output-based aid seeks to address these weaknesses by delegating service delivery to a third party (such as a private company or non-governmental organization) under contracts that link the payment public funds to the outputs or results actually delivered to target beneficiaries. This approach is intended to provide a sharper focus on objectives, improve incentives for efficiency and innovation, enhance accountability for the use of public resources, and create opportunities for mobilizing private financing.

It is suggested by the authors that output based aid approaches can provide sharper thinking about the use of the subsidy, perhaps directing the funds to the one-time costs of service connection - typically the main impediment to expanded access to services - rather than the ongoing costs of consumption. This may be particularly pertinent to WATSAN service delivery, cost recovery, and how donor agencies implement their projects, especially as the

(79) *ERM research as part of preparation for the World Bank publication "Lessons in Private Provision of Rural Infrastructure Services" financed by the World Bank Public-Private Infrastructure Advisory Facility (PPIAF)*

(80) "Contracting for public services: output based aid and its applications." P Brooke and SM Smith (eds) World Bank/ IFC 2001 http://rru.worldbank.org/Hot_Topics_Smith_Brook.asp

authors go on to suggest that depending on the service, small-scale local entrepreneurs could be important suppliers - and so could community groups and NGOs.

1.4.2 *WATSAN projects and livelihood analyses*

Two key publications in the UK have a taken a livelihoods perspective to analyse the design of WATSAN projects and programmes. These are

- John Soussan: Water/ Irrigation and Sustainable Rural Livelihoods pp 181-195, in D Carney (ed): Sustainable Rural Livelihoods: What Difference Can we Make? DFID 1998. ISBN 1 861 92 0822.

- *Nicol, ODI Working Paper 133: Adapting The Sustainable Livelihoods Approach to Water Projects, ODI April 2000*

Livelihoods perspectives on WATSAN delivery

Looking at a WATSAN project within a livelihoods context [81], Soussan suggests that the aim is to understand:

- the potential hydrological resource base - the quality and quantity of the water resource available;

- the existing and potential patterns of use, including which groups use which particular water resources and the contribution they make to their livelihoods;

- the local social and institutional context of water resource use;

- the legal, political and institutional context for water resource use; and

- the trajectories of change for all of these factors, facilitate the positive changes and mitigate the negative changes

Within Soussan's "patterns of water use" theme - he suggests the following issues should be looked at:

- Water and food security. Is water the only limiting factor to livestock? What about constraints on financial, physical and human capital assets? To what extent are local water markets captured by a local elite, thus constraining rights over, or access to, water for the poorest?

([81]) The livelihoods approach typically focuses on the analysis of a set of five interlinked assets, Nicol provides the following description of the asset pentagon: physical capital (household/ individual labour, health), financial capital (access to money), social capital (community mobilisation), natural capital (environmental resource stock), human capital (education and awareness). He also suggests that political capital be included in this analysis of assets.

- Water and household maintenance. The need to mitigate the morbidity threat of direct water borne diseases and water related diseases, is central to the establishment of sustainable rural livelihoods.

- Water based livelihoods. Whose livelihoods (but particularly among the poorest) are based on, or are obstructed by, access to a reliable water supply, and how can these livelihoods best be developed sustainably through the project?

- Water and ecosystem maintenance. Water availability is central to both people's livelihoods and to the character and health of the ecosystem the project is located within. How best can the limited water resources available be used and managed, without harming the environment?

Soussan's five themes could be useful in relation to provide a monitoring, and evaluation process of the WATSAN project and programme within a context of the livelihood based issues of water use.

1.4.3 *Scarcity*

Another analytical thread that Soussan identifies is related to the issue of scarcity. He suggests that, although the underlying factor behind water supply projects is often conceived of as trying to reduce the lack of water as a physical entity, scarcity can also be defined socially. There may be social, economic and institutional barriers that limit access to water for different people, and the structure of rights and entitlements both between and (importantly) within communities may be different. Hence, in thinking about reducing scarcity, a livelihoods based WATSAN project must also think about:

- understanding water supply and access conflicts which may be present and the institutional processes through which they can be mitigated;

- the fact that water scarcity (in a social as well as a physical sense) cannot be purely understood at the local scale alone;

- water scarcity, and the related conflict it produces, is a dynamic; and

- people are not passive victims of water scarcity, but respond in different ways. These responses can provide indicators on how to develop water based livelihoods or mediate water based conflicts.

Accordingly, a "scarcity" checklist, or set of indicators, to guide the project monitoring process could be developed. It may ask to what extent has the WATSAN project or programme:

- Decreased the time taken to collect water

- Decreased the finance needed to be invested in water

- Decreased the time for water left in storage
- Decreased the capture of water resources by elites
- Increased the diversification of livelihoods (especially among the poorest)
- Decreased the loss or disposal of other assets
- Decreased stress on the four water livelihood uses for water (food, households, livelihoods and ecosystems)
- Helped to manage the exploitation of resources more sustainably?

1.4.4 *Demand Assessment for WATSAN within a livelihoods context*

Nicol suggests that WATSAN projects seen within a sustainable rural livelihoods context, provide a productive resource - water- but that, due to its multiple uses, this resource provides different returns to different capital assets within peoples livelihoods basket.

For example, there may be a more tangible return to people's financial asset from using water for livestock (money, savings), then on their physical asset (their health). The way people choose to use the water supplied to them may well be a rational reaction to which of their asset bases is currently weakest. Further, a demand focused approach to water supply, taking on board a livelihoods perspective, would therefore design a water project around the interventions which people feel would provide them with the largest (or most immediate) returns, and thus which they'd be most willing to pay for.

Further, Nicol suggests that a demand focused, livelihoods based approach to water supply projects is a natural evolution from the supply orientated and mostly health based view of water projects which has previously prevailed. If the multiple uses of water fed into a range of people's capital assets, then their demand hierarchies for the use of water may change, depending on their circumstance. He suggests that it is necessary to build a livelihoods approach which is distinct from just 'doing' water project, such that

"an end goal..(may) not be the achievement of health benefits, but seeks to increase the overall robustness of the household asset bundle, in order to strengthen livelihood strategies (and) assist in creating pro-poor outcomes".

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Annex C

The Cost Recovery Survey

C1 THE COST RECOVERY SURVEY

1.1 INTRODUCTION

As part of the research investigation, a cost recovery survey was designed and launched[1]. It was emailed during August- October 2000 to 800 actors in the water and sanitation sector globally, and also disseminated via on several WSS e-discussion groups. Water Aid and DFID helped to review the survey instrument.

78 emails failed to deliver, creating a sample size of 722. Over 100 completed surveys and a selection of written notes were received (a return rate of approximately 10%), as well as a number of reports and background papers which people also sent in.

In general, feedback was very positive to the survey, with 56 survey forms completed to an adequate degree allowing comparative analysis. A database was developed and the survey data inputted and subsequently analysed between September 2000 - March 2001. An undergraduate dissertation for the Scottish Agricultural College was produced from the results.

At its core, the survey attempted to identify:

- What WATSAN organisations understood by the terms 'cost recovery' and 'demand assessment'?
- What WATSAN organisations are doing about cost recovery in rural and peri-urban areas?
- In the experience of WATSAN projects, what approaches to cost recovery seems to work?

1.2 WHO WAS SURVEYED?

The survey grouped organisations undertaking WATSAN projects in developing countries into five main types:

- Private sector companies/consultancies;
- Non-Governmental Organisations (NGOs);
- Development agencies;
- Development Banks/ IFIs; and
- Research/ academic bodies.

[1] *A copy of the survey is presented and the end of this Annex.*

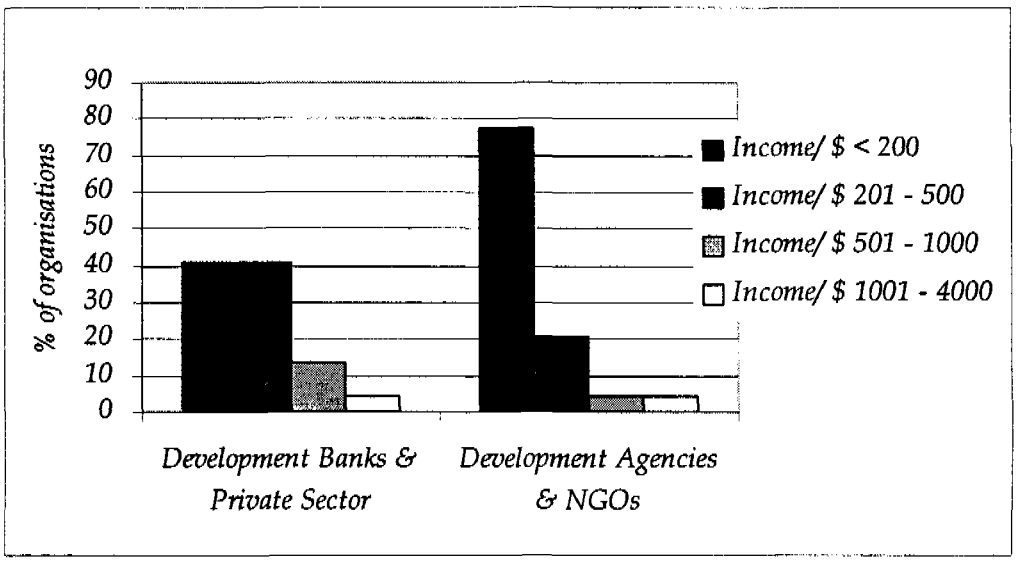
Out of a reasonably balanced survey sample between all five groups of organisation, 31% of replies came from the private sector; 25% from NGOs; 21% from development agencies; 11%from Development Banks/ IFIs; and 7% from research/ academic bodies. This may indicate the higher level of interest the private sector has in engaging on this issue.

These organisations all have differing attitudes to cost recovery in WATSAN projects. In general, NGOs are the least concerned with cost recovery, while private sector companies tend to treat it as a matter of priority.

1.3 *WHERE ARE WATSAN PROJECTS BEING IMPLEMENTED?*

Over a third of the WATSAN projects surveyed, are being carried out in Southern and Eastern Africa. However, many WATSAN projects are also being carried out in South East Asia, North Africa and the Middle East. The majority of these projects are directed at 'low-income' households (between $0-500/ year) in rural and peri-urban areas. The Development Agencies and NGOs who replied serve more households at the bottom of this range (,$200/year) when compared with replies from Development Banks and the Private Sector *(Figure 1.1).*

Figure 1.1 ***Income groups that organisations mostly serve through their WATSAN projects (based on annual household income)***



1.4 *SCOPE OF PROJECTS*

The scope of WATSAN projects varies for each type of organisation (*Figure 1.2*). However most organisations have a clear part of their programme portfolio that concentrates on WATSAN projects, more than for water or sanitation only projects. Interestingly, those Development Agencies who replied, undertake slightly more of their WATSAN projects as part of wider rural development than other organisations (*Figure 1.3*).

Figure 1.1 ***Scope of WATSAN projects carried out by different organisations***

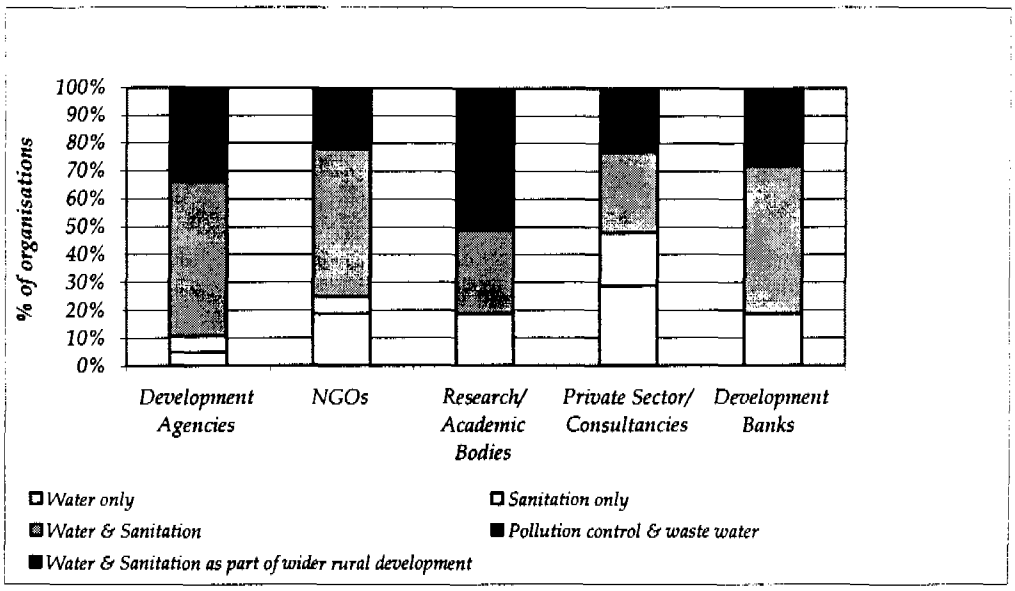
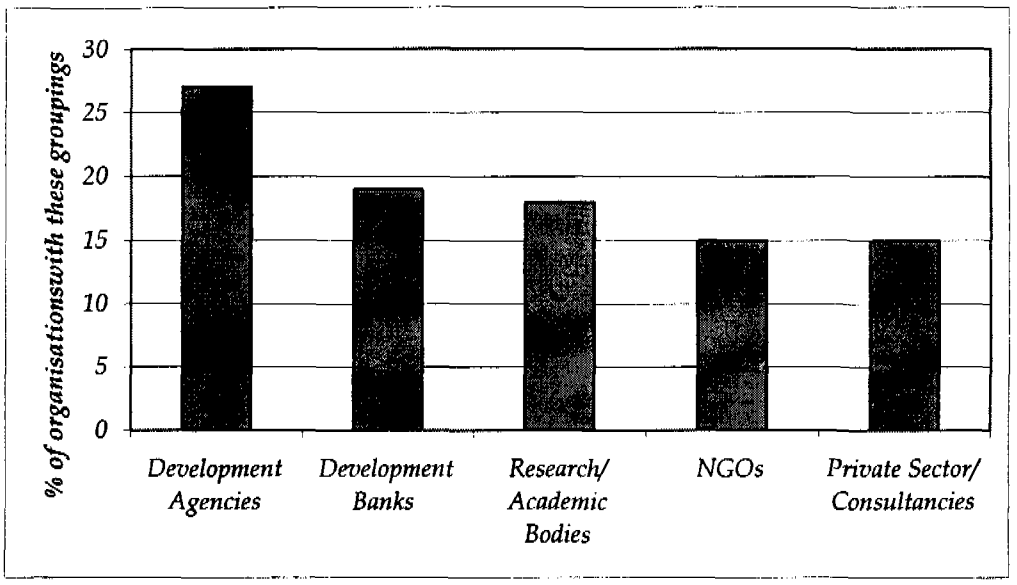


Figure 1.3 ***Organisations carrying out WATSAN projects as part of wider rural development.***



1.5 UNDERSTANDING OF COST RECOVERY

1.3.1 *Meaning*

Cost recovery seems to mean different things to different organisations. For example, the following statements were made in the survey:

"Cost recovery is the attempt to recover project-level operation and maintenance costs" (a Development Agency)

"Cost recovery is the full/partial payment of capital and running costs" (Private Sector)

"Cost recovery involves a capital contribution (c 20%), full operation and maintenance costs, and increasingly ability to finance extensions to the scheme" (NGO).

It was clear that there is no overall consensus on what cost recovery in a WATSAN project or programme means.

1.3.2 *Recurrent Costs*

Most organisations that replied feel that it is necessary to recover at least some of the implementation costs from the community that their WATSAN project serves. The preferred types of costs to be recovered were found to be:

- Operation and management costs only; and
- Operation, management costs and replacement costs.

The range of cost recovery options considered sufficient to achieve financial sustainability in WATSAN projects, based upon those organisations that replied, is shown in *Figure 1.4*.

Figure 1.5 compares which organisations consider WATSAN projects to be financially sustainable if they recover operation, maintenance and replacement costs, or the operation, maintenance, replacement, capital, interest and future expansion costs.

The difference in outlook on this issue between the NGOs and Development Agencies, and the Private Sector and Development Banks/ IFIs that replied is noticeable. A larger number of private sector organisations and Development Banks than other organisations consider that full recovery of costs is required for a project to be financial sustainable.

"Cost recovery is ensuring project sustainability by guaranteeing that users of the project are taking on the cost of sustainability through efficient financial responsibility" (Development Bank)

Some Development Agencies and NGOs have begun to think along these lines.

" Cost recovery is ensuring there is a system in place for the collection of funds so that communities can maintain the project" (NGO)

Figure 1.4 ***Levels of cost recovery considered sufficient to achieve financial sustainability of WATSAN projects***

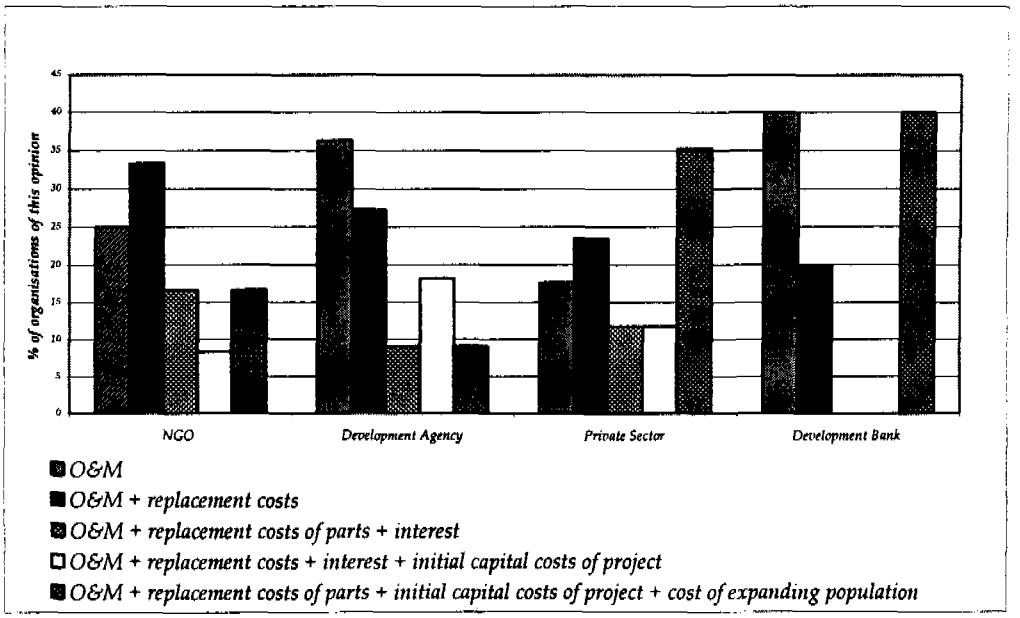
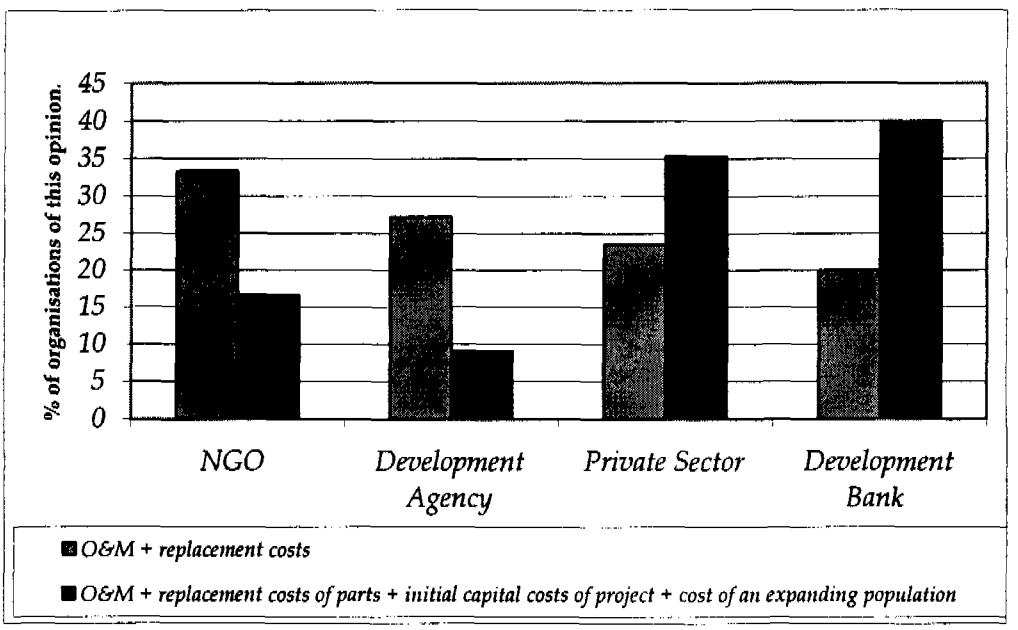


Figure 1.5 ***Levels of cost recovery considered sufficient to achieve financial sustainability of WATSAN projects.***



These differences between the private and public sector approaches to cost recovery may differ for the following reasons.

For the public sector (NGO/ development agency), the financial remit for a WATSAN project is:

- Meeting basic needs as stipulated in other government policies;
- Equitable use of subsidies; and
- Break-even, i.e., revenue generated equals the cost of supply.

For private companies, their remit is to:

- Generate a profit or surplus; and
- Ensure a return on fixed assets.

1.6 *COMPLICATIONS TO COST RECOVERY*

Although many organisations that replied have the intention to make a WATSAN project financially sustainable through adequate cost recovery, there are often factors that complicate this process. The most prevalent of these tend to be political factors, such as inappropriate public policy or a lack of political willingness to institute cost recovery mechanisms. The institutional establishments and framework are also critical.

"The projects undertaken by my organisation are affordable, with appropriate technologies, but government schemes still tend to use expensive high technologies".

According to the organisations that replied, a range of additional factors can also complicate the cost recovery process, such as [2] :

- Low and/ or variable incomes;
- Affordability and appropriateness;

"Ability to pay is critical, but providing affordable services to meet peoples' needs is even more important."

- Insufficient willingness to pay;

"An appropriate level of service must be provided according to the demands of the community. Willingness and ability to pay will play a role in this."

- Distrust of the cost collection system; and
- Lack of management transparency.

"Transparency and accountability for operators' (and governments') actions are critical for cost recovery, especially for the population involved."

Historical practices were also said to play a role in the degree of cost recovery. For example if other agencies have provided the service free of charge, a history of non-payment and a subsequent lack of willingness to pay may result.

Other less significant issues included:

- Expense of the service and project;
- Land tenure issues;
- Culture and religion;

(2) This list is by no means complete. Many other factors were also mentioned: - inappropriate project design, bad examples created when other agencies fail to recover costs, social exclusion issues, land tenure issues and project expense

For both water and sanitation projects, the flux of the population size is deemed to be, the least important factor resulting in complications for cost recovery.

Table 1.1 summarises the issues seen as complications to cost recovery.

Table1.1 ***Complications to Cost Recovery in WATSAN Projects (Ranked In order of the issues most often stated by organisations working on WATSAN projects)***

	Water		Sanitation
1	Political Interference	1	Political Interference
2	Low/ Variable Incomes	2	Insufficient Willingness to Pay
3	Distrust of Cost Collection System	3	Low/ Variable Incomes
4	Insufficient Willingness to Pay	4	Lack of Management Transparency
5	Lack of Management Transparency	5	Distrust of Cost Collection Systems
6	Inappropriate Project Design	6	Failure of Other Agencies to Cost Recover
7	Failure of Other Agencies to Recover Cost	7	Inappropriate Project Design
8	Expense of Project	8	Cultural/ Religious Reasons
9	Social Exclusion Issues	9	Social Exclusion Issues
10	Land Tenure Issues	10	Land Tenure Issues
11	Cultural/ Religious Issues	11	Expense of Project
12	Flux of Population Size	12	Flux of Population Size

It is interesting to note however, that political interference ranked top of the replies in both instances, above low income or unwillingness to pay. Interestingly, this is exactly the same finding about obstacles to cost recovery as identified by another review - the Business Partners For Development review of cost recovery in their Partnership projects in the water cluster (K Komives and L Stalker-Prokopy (2000) *Cost Recovery in the Focus Projects: Results, Attitudes, Lessons and Strategies.* Business Partners for Development Research and Surveys Series.)

1.7 *MEASURING AFFORDABILITY.*

The 3-5% rule has often been used as a measure of affordability for WATSAN services. It has been considered a simple yet relatively accurate measure of affordability that can assist decision-making. The survey revealed 28% of those who responded still use the 3-5% rule, stating that as an initial tool it can be useful.

"The 3-5% rule provides an indication of whether a technical plan is financially feasible in terms of ongoing operation and maintenance costs, but it is only an indication and should not be considered as a final calculation"
(Private sector/consultancy)

However, there was also a realisation from other respondents that this rule is too simplistic and the issue is far too complex to simply provide a blanket rule for all situations.

'It is not really possible to define a unique ratio for such a complex issue. Every local situation should have its own appraisal of what is possible'
(Private Sector/Consultancy)

Other methods for measuring affordability suggested in the survey responses included:

- PRA techniques including wealth ranking and community self-assessments of individual's ability to pay;
- WTP surveys (Contingent Valuation questionnaires);
- Community financial surveys;
- Use of past experience in other villages
- Cost of current coping strategies; and
- Use of wealth indicators such as transport and purchasing habits.

In trying to find the most suitable way to measure affordability, some of the organisations that replied have found interesting and somewhat unique approaches. For example, a private sector organisation in South Africa, used the amount of consumption of beer as an indicator of actual (effective) affordability for a WATSAN service.

1.8 *DEMAND ASSESSMENT*

In the move away from using the 3-5% rule, most respondents saw demand assessment techniques, of one form or another, as a useful tool in helping to achieve financial sustainability in a WATSAN project.

"Demand assessment improves the chances of the project being financially sustainable as compared to a supply driven approach". (NGO)

1.3.1 *Meaning*

There was a range of different ideas as to what demand assessment actually was, but most focused around matching a level of service provision to a willingness to pay for it:

'Demand responsive approaches need to reflect the present need and interest and affordability of consumers or communities. Demand is dependent on health, social and environmental values.' (NGO)

"Demand assessment involves assessing peoples needs and wants and comparing these with the willingness to pay and ability to pay for the expected services" (Private sector/consultancy)

"Demand assessment is a feasibility study assessing demand for water service improvement and willingness to participate, involving time and money" (Development bank)

1.3.2 *Experience*

While a number of the survey respondents explicitly stated that it is essential to assess demand prior to the start of a project, 73% of the respondents stated that they determine people's preferences for different levels of service at some stage during the project.

The survey found that, from respondents' experiences of demand assessments, the three most important factors for project viability and financial sustainability were:

- The interest and demand from the consumers;
- The consumer's needs; and
- The affordability of the service.

However, many other factors to take into account were considered important, such as:

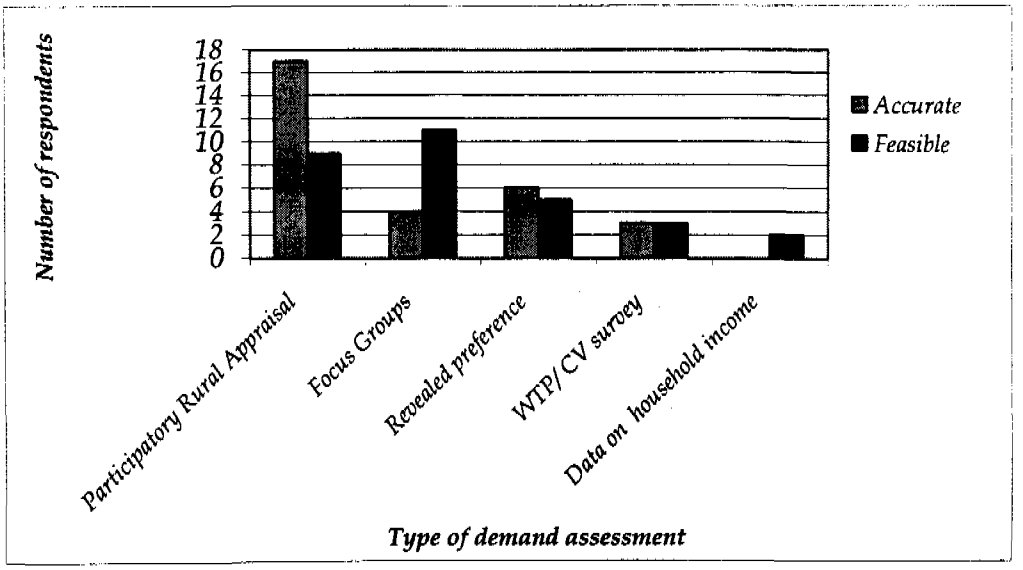
- Community interest in levels of service;
- Willingness to Pay;
- Demand creation;
- Willingness to Participate; and
- Evaluation of present and projected community characteristics

It is interesting to note that above willingness to pay and affordability stands the need to find an interest and the (notional) demand from the consumer for the service.

1.3.3 *Approaches*

There are many types of demand assessment techniques used in practice, however the most frequently used by those who replied, are participatory rural appraisal and focus groups. *Figure 1.6* show the preferred demand assessment techniques, in terms of accuracy and feasibility, are shown in.

Figure 1.6 ***Most preferred demand assessment techniques in terms of accuracy and feasibility***

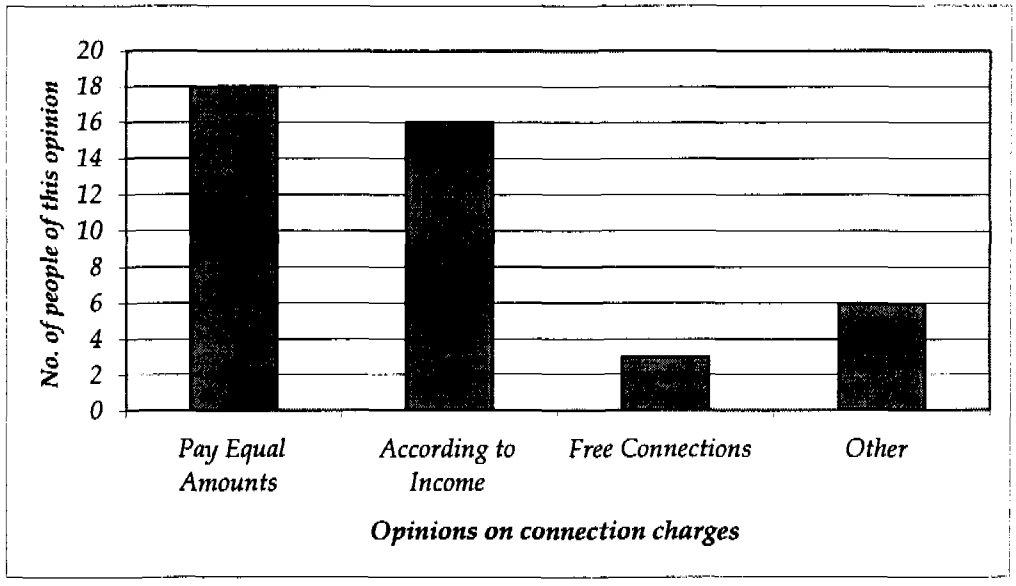


It seems that resource or technical intensive studies such as Contingent Valuation are used less often, and focus groups, though less accurate are more widely used. Responses to PRA were interesting. Though it is considered accurate by many respondents, its feasibility, though still strong, is less than that of focus groups. Again, perhaps time and resource constraints are an issue here.

1.9 CHARGING FOR WATER AND SANITATION SERVICES

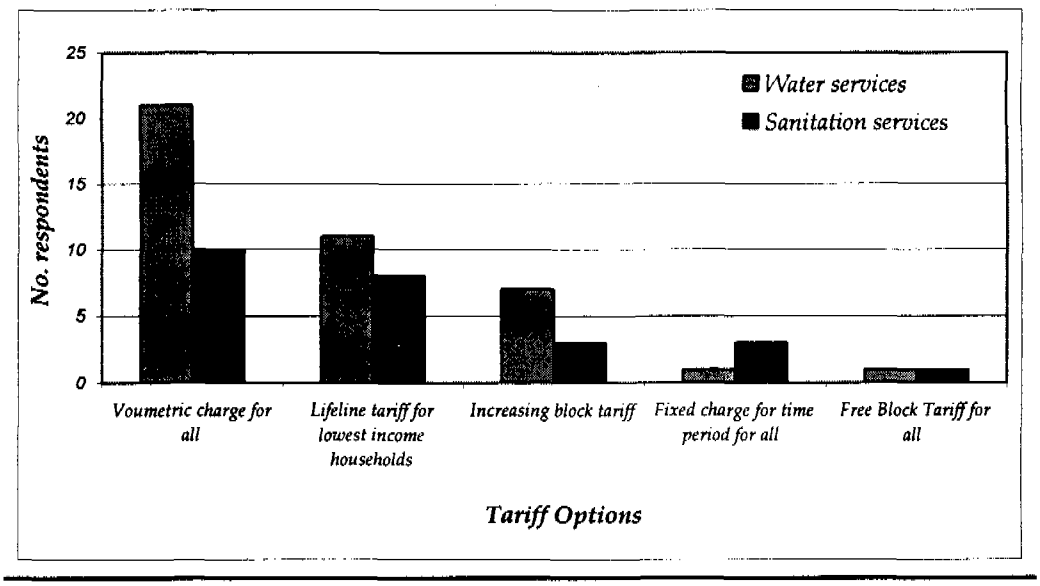
When asked about charging for WATSAN, the respondents were asked to consider what the connection charges should be, and how tariffs should be structured. The survey revealed that free connection to water services were not considered to be the best form of water and sanitation provision. In fact, 42% of respondents felt that users should pay equal amounts for their water connections, while 37% considered a connection charge which reflected the user's level of income was more appropriate as shown in *Figure 1.7.*

Figure 1.7 ***Summary of the opinions on structure of connection charges***



For both water and sanitation provision, once the connection charge is established, the majority of organisations who replied believed that users should be charged in relation to the volume of water that they use. Lifeline tariffs for the lowest income households and increasing block tariffs were considered to be useful charging structures (*Figure 1.8*).

Figure 1.8 ***Most desirable tariff structure for WATSAN services***



1.10 WHAT WORKS?

1.3.1 *Attributes of the project*

Within rural water and sanitation projects, a number of factors were considered relevant attributes of a successful project. These are listed in *Table 1.2* ranked in order of descending importance. It shows that reliability of service and distance to household were considered the two most important features of water projects whereas convenience and cleanliness were ranked highest for sanitation projects.

Table 1.2 ***Attributes of successful rural water and sanitation projects***

Rank	Water projects	Sanitation projects
1	Reliability of supply	Convenience
2	Distance to household	Cleanliness
3	Price charged	Ability to upgrade
4	Community managed	Administering agency
5	Quality	
6	Operation, maintenance and charging	
7	Administering agency	

These factors within *Table 1.2* are mainly associated with aspects of the supply, but concerning the process a number of organisations stress the importance of public involvement. For example, an NGO in India considered the payment collection mechanism to be a success due to the *people-based system of fund collection, management, utilisation and maintenance.* Along the same lines a private sector company in South Africa stated that success was due to *transparency and a high level of public awareness and availability of relevant information.*

Others mentioned the financial arrangements for the projects, and one interesting response, by a private sector company, was that *availability of flexible payment systems,* helped to ensure a successful project due to successful payment collection.

SURVEY: BEST PRACTICE FOR FINANCIAL SUSTAINABILITY OF WATER AND SANITATION (WATSAN) PROJECTS/ PROGRAMMES

ORGANISATION DETAILS

1. **Name** --

2. **Organisation/ contact details** --

3. **Profession:** (please circle)

Engineer *Economist* *Social Anthropologist* *Accountant* *Other (specify)*

4. **Job title/ responsibility** --

5. **Type of organisation (please tick):**

- Development Agency ☐
- NGO ☐
- Research / Academic Body ☐
- Private Sector/ Consultancy ☐
- Development Bank. ☐

Other (please specify):

6. ***Regional distribution of your WATSAN projects*** (if you operate in several regions, please indicate distribution in descending order [1st, 2nd etc]of your investment schedule or level of activity

- Southern/ Eastern Africa ☐
- North Africa/ Middle East ☐
- India ☐
- Other countries in South East Asia ☐
- China ☐
- Pacific Rim ☐
- Central and South America ☐
- Eastern Europe / NIS ☐
- Other (please specify)

----

7. ***Scope of water related projects*** *(please circle, or rank in descending order [1st, 2nd etc] of your level of activity)*

a) Water only b) Sanitation only c) Water & Sanitation

d) Pollution control and waste water projects; e) Water and sanitation as part of wider rural development projects.

8. ***What is the typical income per person per year (in US $) that your WATSAN projects work within annually (please circle)? If you operate within several income bands depending on different WATSAN projects, please indicate in descending order the most common income bands you work with.***

Less than 200 201- 500 501- 1000 1001 – 4000

Other (please specify):

9. ***Do you have a key [illegible] target group for your WATSAN projects? Please specify what and why.***

10. ***Type of customer: If you work with several types of customer depending on different WATSAN projects, indicate in descending order [1st, 2nd etc] the most common customer types you work with:***

- rural communities; ☐
- peri urban/ slum communities; ☐
- small urban communities; ☐
- larger urban communities ☐
- small businesses; ☐
- industry ☐

- other (please specify):

11. ***Project Size:*** **Please indicate in descending order [1st, 2nd etc] the most common sizes of WATSAN projects you work on.**

- Serving fewer than 50 households ☐
- 50-100 households ☐
- 100 -500 households ☐
- more than 500 households ☐

Do you tend to work with different numbers of households depending on the type of WATSAN project customer you are involved with? (e.g. urban customers = larger project populations, rural customers = smaller project populations)

----

12 ***In general, what are the key objectives of the WATSAN projects you are involved with?***

----

13. ***What types of project partner (if any) do you generally work with on your WATSAN projects?***

- NGOs; ☐
- Donor agency; ☐
- Community organisations ☐
- Government parastatal . ☐

- other (please specify):

----

14. Please indicate in descending order [1st, 2nd etc] your organisation's role in helping to deliver these projects:

- help with project design ☐
- help with project implementation/mobilisation ☐
- help with the provision of funding ☐
(loans / grants)
- help with project management ☐
- help with advocacy/policy approaches ☐
- help with capacity building for local partners involved in WATSAN projects ☐

To what extent does the exploration of project financing issues play a part in your help?

FINANCIAL PREFERENCES IN PROJECT DESIGN

15. In general, what is the duration of the design period of the projects you are involved with?:

- Under 1 year ☐
- Under a 2 year design period ☐
- Over a 2 year design and implementation period ☐
- other (please specify):

---

16. What do you understand by the following terms?

- *Demand assessment/ demand responsive approach*
- *Cost recovery*
- *Identifying people's preferences*

---

17. What in your view are the critical elements of a sustainable water/sanitation project? If you think that there are several elements that are critical, please indicate them in descending order [1st, 2nd most critical etc].

	Water	*Sanitation*
• Adequate availability of water to the user community over the project lifetime	☐	
• Proximity of resources (water and sanitation) to user community;	☐	☐
• Developing education and awareness about project issues and equipment;	☐	☐
• Encouraging community management of the project;	☐	☐
• A stable political/ legislative environment	☐	☐
• Building something that people want?	☐	☐
• Building something that people will pay for?;	☐	☐
• *Incorporating community financing mechanisms;*	☐	☐
• A stable community population;	☐	

- other: Water:

Sanitation:

---

18. Do you determine people's preferences for different levels of service in your projects (please circle)

Yes No

(If you have answered Yes, please refer to questions 19-22.)

19. At what stage do you elicit peoples financial preferences for a water/sanitation project? (please tick ONE)

- Identification ☐
- Pre feasibility ☐
- Feasibility ☐
- Implementation ☐
- Appraisal (or pre appraisal) ☐

20. Which demand assessment techniques do you use?
If you use more than one approach, please indicate in descending order [1st, 2nd most used etc] the demand assessment techniques you use most for WATSAN projects.

a) focus groups using key informants/ stakeholders; ☐
b) PRA/ community survey; ☐
c) Revealed preference surveys - i.e. finding out about use of vendors / water coping strategies; ☐
d) willingness to pay/contingent valuation surveys; ☐
e) data on national or regional household income distribution. ☐

f) other:

Why do you use them?

---

21. Which method, referred to in Q. 20 do you think elicits peoples financial preferences most accurately? (please circle)

a) b) c) d) e) f)

Other:

---

22. Which method, referred to in Q. 20, do you believe is the most feasible way of eliciting peoples financial preferences, given time and resource constraints? (please circle)

a) b) c) d) e)

Other:

23. ***What is your general opinion on trying to elicit people's financial preferences for water supply/ sanitation projects in more depth?***

24. ***How do you judge the financial sustainability of WATSAN projects - is it by recovering one of the following gradations of cost from your customers?*** *(please tick one)*

a) Operation and maintenance costs (O & M); ☐
b) O & M + replacement costs of parts; ☐
c) O & M + interest + replacement of parts; ☐
d) O & M + interest + replacement of parts + initial capital cost of project; ☐
e) O & M + interest + replacement of parts + initial capital cost of project +cost of expanding the population served by the project in the future. ☐ ☐
f) An approximation of long run costs (e.g. average incremental cost/ m3)

25. ***Which type of water/sanitation cost recovery schedule, referred to in Q. 24, do you most often use/ would you feel most comfortable with?***

a) b) c) d) f)

Further comments

26. ***Is the 3-5% (of annual income spent on water and sanitation services) rule, a useful one for gauging the affordability of water supply and sanitation projects?*** *(please circle)*

Yes No

Please explain your response in more depth:

27. ***Do you use any other measures of affordability for your WATSAN projects?***

28. ***How do you determine any level of subsidy that is given as part of your projects?***

For eamplke (please tick)

- per capita grant amount for each project participant ☐
- block grants as a percentage of capital cost ☐
- via cross subsidisation systems ☐
- other (please specify)

29. ***Do you attempt to forecast changes in demand for water consumption and/or sanitation use over the lifetime, or as a result of, your projects?***

Yes No

30. ***If your answer to Q29 was Yes, how is this done? (please tick or number in descending order)***

- Population projections ☐
- Population and income elasticity information [1] ☐
- Per head consumption from different types of water intervention ☐
- Other:

31. ***Do you aim for a minimum benchmark quantity of water or sanitation services to be supplied by your projects? (please circle)***

Yes No

32. ***What is this benchmark for water projects (litres/person/day)?*** *Please circle*

10 20 40 100 120 +

33. ***What is the equivalent benchmark for the sanitation projects you are involved with?***

Further comments:

34. ***Do you use micro- financing/ credit mechanisms to help with the payments of water?***

Yes No

With what degree of success?

(1) This means the use of a factor that shows the relationship between what happens to consumption as income increases. For example, an income elasticity 0.3 means that if income doubled, consumption would increase by 30%.

35. ***Do you use micro- financing / credit mechanisms to help with the payments of sanitation?***

Yes No

36. ***What factors would you say determine whether payment collection mechanisms in WATSAN projects are successful?***

Institutions and Financial Sustainability for WATSAN projects

37. ***In your view, which type of institutions support WATSAN project user payment schemes best?***

- Project focused community institutions (eg project user committees); ☐
- Traditional or political groups at the village level (eg village councils); ☐
- Community councils and local/national NGOS; ☐
- Community councils and other national organisations (eg government); ☐

- Other (please specify):

38. ***What do you feel are the key institutional requirements at both the municipal and the macro level for WATSAN project/programme success, particularly in relation to financial sustainability?***

WATER AS AN ECONOMIC GOOD

39. ***Which one of the following statements is closest to your views about household water supply in the projects you are most involved with?***

Please tick one

- Everyone has a basic right to water which means that people should receive water for free; ☐
- It costs money to supply water and payment for each unit of water consumed should reflect some of the financial costs of supplying each unit of water; ☐
- Everyone has a basic right to a minimum level of free supply, thereafter users should pay something to help towards the costs of supply ☐
- Higher income households should pay more for water consumed than lower income households to help towards the costs of supply ☐
- It costs money to supply water and payment for each unit of water consumed should reflect all of the financial costs of supplying each unit of water ☐
- Water is a scarce resource and as such prices should reflect the availability of water. ☐

Other (please specify):

Do you think these statements can shift over time for a project?

40. ***Do you agree with the following statement:***
"Cost recovery is necessary and sufficient for the sustainability of a water/sanitation project"

Yes No

Please expand on your answer below

41. ***What factors make recovering costs less straight forward for some water/sanitation interventions than others (please number in descending order of importance)?***

Please indicate 1= most important to 5 = least important	Water	Sanitation
• *households have low/variable incomes;*	☐	☐
• households are not willing to pay (or pay much) for the project;	☐	☐
• households are distrustful of the collection systems for their users charges;	☐	☐
• there are social exclusion issues within the user population;	☐	☐
• there was a lack of transparency in project management;	☐	☐
• the project design is in appropriate	☐	☐
• there is political interference resisting the approach of user charges	☐	☐
• other agencies don't make the population pay for their projects;	☐	☐
• *the community populations flux in size over time;*	☐	☐
• there are land tenure issues - who pays the landlord or the lessee ?;	☐	☐

- there are cultural/religious reasons; ☐ ☐
- the project is too expensive to recover costs

- *other:* *Water:*

Sanitation:

---

42. What in your opinion is the most critical factor determining whether cost recovery is feasible?

For water?

For sanitation?

---

43. Some schemes are inevitably going to recover less than 100% of their costs for their users. Does this matter to you? Are there any other rules implemented by your organisation concerning how to meet such capital and operational funding shortfalls?

---

44. What, in your opinion or experience, are the difficulties associated with the principles of cost recovery for WATSAN projects? Please rank in descending order of most to least difficult issue.

- Why should people pay? ☐
- *Most people cannot afford to pay a realistic amount that will help towards* recovering costs. ☐
- If projects are only built for those who can pay, this is an un-equitable approach for WATSAN development. ☐
- Though they might be willing, people often don't have the cash to pay a regular water charge ☐
- It is difficult to put money values on the non cash work and time contributed by households or communities as part of the construction or O&M of the project. How do we avoid double charging these people? ☐
- Getting people to pay in principle is not the problem - engendering trust and organising the routine collection and the secure management of revenues is a much bigger obstacle; ☐
- It is sometimes difficult to identify and explain exactly what is being charged for and to whom? ☐
- There can be an inconsistency in promoting a system of cost recovery for the scheme, when compared to the availability of other grant sources and/or central government approaches; ☐
- Households have to see an improvement in service first, before they start paying for it. This takes time and delays the recovery of any costs. ☐
- *It is unrealistic to expect communities to pay on the basis of opportunity costs for* water - anything more than a financial charge based on a gradation of project costs will be too expensive ☐

- *other:*

TARIFF CHARGING STRUCTURES

A water supply & sanitation project/programme can include meter installation and the provision of access to a wider water and sewage network. In these circumstances a volumetric tariff can be calculated.

45. Which of the following statements is closest to your organisation's views about paying for connection to the new network?

- Connections to the network should be provided free to all potential users ☐
- Water and sewage services are a necessity, but supply is costly, so everyone should pay for being connected to the network *according to income levels;* ☐
- Water and sewage services are a necessity, but supply is costly, so everyone should pay an *equal amount* for being connected to the network ☐

Further comments:

---

46. Which of the following statements is closest to your organisation's views about structuring a water services tariff in relation to consumption? (please rank from most to least desirable tariff structure)

	Water	Sanitation
• Free block tariff for all;	☐	☐
• Lifeline tariff for lowest income households;	☐	☐
• Increasing block tariff;	☐	☐
• Fixed charge per time period for all;	☐	☐
• Volumetric charge for all;	☐	☐

- Other

Final Issues

47. From your knowledge/ experience, does taking a demand responsive approach to WATSAN project design really help in strengthening the financial sustainability of the project, or are other issues more important?

48. Do you think that all the agencies involved in WATSAN projects have a common approach to (or understanding of) demand assessment for their WATSAN projects? Should they?

49. How is any demand assessment information on WATSAN projects that is gathered by your organisation used to guide or creating subsequent user charges or tariffs?

50. Of the following, which do you consider the four most relevant attributes of successful rural water and sanitation projects? PLEASE MARK 1 =MOST IMPORTANT TO 4 = LEAST IMPORTANT

Water:		*Sanitation*	
• *Distance to household (convenience)*	☐	• *Convenience*	☐
• *Quality*	☐	• *Ability to upgrade*	☐
• *Price charged/cost*	☐	• *Cleanliness*	☐
• *Reliability of supply*	☐	• *Administering agency*	☐
• *Administering agency*	☐		
• *(operation, maintenance and charging)*	☐		
• *Community managed*	☐		
OTHER (please specify)		*OTHER (please specify)*	

Given what you have said in this survey, what are your opinions on your organisation's approach to cost recovery, for example the difficulties involved in achieving financial sustainability, and possible improvements in how to do so: What would you like to see from research in this area?

Thank you for your time and patience in filling out this questionnaire.

We are interested to determine the characteristics of a financially sustainable WATSAN project - in other words one that has successfully attained a viable level of cost recovery. Are you able to suggest a real project that you consider to be a good example of cost recovery in practice? Alternatively, are there projects you can think of which highlight the problems of trying to use demand assessment or achieving cost recovery?

- Name of Project _____
- Agencies Involved _____
- Location _____
- Brief Description

Would you be happy for this research project to contact the project and find out more?

- Contact Details of Project Manager

Annex D

Meta Analysis of Water and Sanitation Willingness to Pay Studies

D1 META ANALYSIS OF WATER AND SANITATION WILLINGNESS TO PAY STUDIES

1.1 BACKGROUND

A paradox in the cost recovery debate is the observation that poor households will frequently outlay a considerable percentage of monthly income to secure water from alternative sources when regular supplies are unavailable or substandard. These observations, arising from revealed value studies of time spent collecting at informal sources, and household spending on water vendors, give rise to an elementary question. If households are prepared to make significant economic sacrifices in pursuit of alternative services, how might it be possible to present recipients with a the service they actually want and are prepared to pay for? The same revealed value surveys substantiate the view that the 5% rule is inappropriate for planning and that appropriately design and delivery could unlock similar household commitment in terms of willingness to pay.

Beyond this observed behaviour a considerable body of evidence has been accumulating in the literature assessing household willingness to pay in hypothetical market studies. Much of this literature uses the Contingent Valuation Method (see section), which has seemingly by default come to play a central role in the dra process.

CVM enables hypothetical questions to be posed about the level of service. What emerges form this is that WTP for a given level and type of water service is often large enough to support service levels above the minimum often prescribed (World Bank Water Demand Research Team, 1993; Singh *et al*, 1993; Garn, 1998; Rall, 1998; Webster, 1998; Mvula, 1999a). Moreover evidence from a range of cross-sectional studies consistently shows that while income is indeed a significant factor in determining households' effective demand for water services, it is not the sole determinant of demand (Whittington *et al*, 1990b; Altaf *et al*, 1992; Altaf *et al*, 1993; Bohm *et al*, 1993; Brookshire and Whittington, 1993; Fass. 1993; Howe and Dixon, 1993; McPhail, 1993a, b; 1994; Singh *et al*, 1993; Griffin *et al*, 1993; World Bank Water Demand Research Team, 1993; Briscoe *et al*, 1995; Nyong and Kanaroglou, 1999). Rather, willingness to pay is a function of several variables that reflect the socio-economic, demographic and physical environmental characteristics of households that may vary according to season and location. These findings are convergent with the view that a demand-responsive approach (DRA) to project planning, in which the design and implementation of projects are informed by the revealed or expressed preferences of households themselves. In so far as is practibly possible given engineering constraints, a project intervention should aim to match supply with the diverse levels of demand that are backed by WTP.

It is interesting to note however that to date no general overview has been undertaken to summarise the empirical lessons from existing studies. It

seems appropriate at this point to investigate this information for general lessons about the drivers of household preferences and to see whether it is possible to say anything about the key relationship between income and willingness to pay.

1.2 *META ANALYSIS*

We use meta analysis as a means to analyse the body of studies identified as dealing with water and sanitation supply. Meta-analysis is a means of providing a statistical review of existing studies and permits the systematic investigation of the magnitude and direction that selected variables across the range of studies may have on demand. It also allows the analyst to isolate exogenous elements such as study design and conduct features that may influence respondents' *stated* WTP but that are not determining factors in *actual* WTP (where actual WTP is still a statement of intent in response to the proposed service arrangement). In essence we are trying to isolate the relevant variables that CV studies show to be relevant in a demand responsive approach. In driving household preferences, these are the key elements that have to be considered in a cost recovery strategy.

A secondary aim of the study is to evaluate the potential of meta-analysis as a research tool to inform policy-making and water project planning through the use of benefit transfer. Since it is often expensive and time-consuming to conduct detailed household surveys, methods are being sought that allow for the transfer of findings from one study site to another where the sites exhibit near-identical characteristics. This is important in the WATSAN debate since the development of a function that can predict approximate WTP may facilitate policy analysis across a number of countries

1.2.1 *Method*

But by stacking the data provided in the individual valuation studies used in this meta analysis, we investigate the relevance of the statistical function that emerges from the analysis of the analysis in each individual study. In other words we attempt to derive a meta function that explains the levels of WTP across countries, and which can be borrowed to assess the likely WTP levels needed for cost recovery.

The principal result of a CVM study is a mean (average) or median[1] community WTP that can be used in cost-benefit analysis of the change and to guide tariff design. A typical study may elicit WTP responses from hundreds of individual households and these data will be analyzed to derive both this mean/median and a statistical function to explain and validate the responses received. Thus in notational form, in each individual study a questionnaire we collect the data on WTP in response to proposed service change (▣Q) and typically data on income (Y) prices of other goods (P) and other socio

[1] Both are measures of central tendency, but the median is the amount of money that just over 50% of a sample population would be WTP.

economic characteristics (SE). Next a final statistical relationship will be derived showing and verfiy how the WTP statements will be a function of the proposed change in Q proposed improvement in water services and of all other factors which influence the household's valuation of a change in Q including Y, the price of other goods P and a range of other socioeconomic characteristics of the household.
For the individual study this function will typically be of the form:

(1) $WTP = f(\alpha \Delta Q, \beta Y, \gamma P, \delta SE) + \text{statistical error}$

What is estimated in this statistical analysis are the relationship between the variables them as described by the coefficients ($\alpha, \beta, \gamma, \delta$). These coefficients explain the causality and magnitude of the influence of these other variables on WTP. Effectively they tell the story of how the data collected explains the WTP responses collected in the CV section of the survey.

To proceed from a single study result to a meta analysis, we then take from each individual study the estimated mean (or median) WTP for that study and the coefficients from the specific study bid function to compile a new data set that can be used to estimate mean or meta coefficients. The idea then is that this reanalysis of this data set leads us to a mean function that can be used in a generic predictive way to make general inferences about the relationship between WTP and key variables. For example, assuming a meta function of the generic form of equation (1) above. All we would have to do to predict the level of WTP for any project in a particular country and site, is to take the estimated mean coefficients and plug in the mean variable values for the variables
ΔQ, Y, γP, and SE. Thee data will generally be observable for the site of interest.

The significance of this process is to simplify demand-responsive planning. If we can transfer the meta function then the process known as benefits transfer is much simplified.

1.2.2 *Data*

From the exiting body of valuation studies, Table 1 was drawn up to identify the variables that partly explain WTP. The table details the direction of assumed causality

The meta-dataset comprised 25 studies yielding a total of 91 (mean WTP) observations and corresponding to an average of 3.6 observations per study. The studies included in the analysis and the corresponding number of observations taken from each study is presented in Table 2. More than half of the studies provided more than two observations with two studies providing twelve observations (*Table 3*). One of these two studies provided one observation from each of twelve villages within the study site (Boadu, 1992) while the other assessed the WTP bids of households in three villages and asked respondents in each of these villages to value a particular level of

service (private or communal) depending on the service that each household already had in place (Altaf *et al*, 1992; 1993).

The average sample size was 180, with the smallest sample comprising 13 households and the largest, 968. The wide range of inter- and intra-study sample sizes is likely to cause clustering and generate a significant amount of apparent variability in the WTP bids (Deaton, 1997). In surveys of rural areas where the clusters are often villages, so that households in a single cluster live near one another and are interviewed for the same study, data may be produced where observations from the same cluster are more like one another than are observations from different clusters. This may be as a result of 'neighbourhood effects' (Deaton, 1997) where those who live near one another and thus become more or less uniform within a village copy the local eccentricities. Sample villages are often widely spatially separated, their inhabitants may belong to different castes or tribes and they may have distinct occupational structures[1].

As *Table 4* shows, ninety percent of the studies included in the meta-dataset were CVM studies and nearly three quarters of all the WTP bids were obtained through some form of bidding game[2]. Only one quarter of the studies were undertaken after the publication of the NOAA guidelines in 1993. Over half of the set of studies report to have been influenced by one author (Whittington) with seven out of the twenty five studies included in the meta-dataset conducted with Whittington as part of the research team. Only two observations (from one study) allowed respondents time to reflect on their responses. Table 5 presents a basic summary of the valuation outcomes by the various study characteristics including estimated medians. It is difficult to say how the calculated median WTP figures for the different dates, authors and conduct methods differ from *a priori* expectations, as the direction of magnitude of the effect is ambiguous. Median WTP was higher for studies conducted after 1993 as well as for those where Whittington was or may have been a major influence. It was also higher for studies using stated preference approaches than for those using revealed (possibly confirming the expectation that respondents feel under more pressure in the presence of the interviewer and will try and comply with what they perceive to be the interviewer's expectations). Stated WTP was marginally lower for open-ended than for closed-ended, but again the elicitation procedure has an ambiguous effect on WTP. Respondents who were given time to think about their responses bid less, on average, than those who were not although the sample size for those given time to reflect was small so the results are not necessarily statistically valid.

[1] The main problem with clustering is that the sample variance is inflated above what it would have been in the independent case but where multiple observations are obtained from the same environment, random effects can sometimes be controlled for in ways that would otherwise not be possible (Deaton, 1997). The cluster design of the data should not be ignored as the standard formulae for variances of estimated means will be too small. This is as much an efficiency issue as an accuracy issue. Since the error terms in the in regressions are correlated across observations, OLS regression is not efficient within the class of linear estimators and some other linear estimator may be more appropriate (Deaton, 1997, p74).

[2] It is assumed that bidding procedures can only be performed when CVM is used.

Statistically, the differences found in average WTP in each category of can be confirmed by the outcome of the non-parametric Kruskal-Wallis test statistic. H refers to the test-statistic for the Kruskal-Wallis test which has, under the null hypothesis, approximately a chi-square distribution. *p* is the two-tailed probability of the Type I error (that is, that the null hypothesis will be rejected when it is in fact true). The results presented in Table 6 indicate that there is a significant difference at the conventional significance levels between recorded WTP amounts among studies conducted by different groups of people and using different methods of researching WTP. The elicitation format and date of study do not, however, appear to result in statistically significant differences in recorded WTP amounts.

1.3 *Study Site Characteristics*

One-third of the studies (29 observations) were conducted in middle-income countries with the remaining studies being undertaken in low-income countries.[1] Of the studies conducted in middle-income countries, only two (those from Brazil and South Africa) were from upper middle-income regions (*Table 7*).
As would be expected, the median WTP was higher among middle-income countries than among lower-income countries and was more than five times higher among urban respondents than among their rural counterparts (*Table 8*).

It is interesting to note from *Table 7* that the two upper-middle income countries are also those with the most unequal distribution of income. The Gini Index is a measure of the extent to which the distribution of income among individuals and households within an economy deviates from a perfectly equal distribution, where an index of 100 represents perfect equality (Todaro, 1994). An examination of the Gini co-efficients and percentile income shares for the other countries included in the study (World Bank, 2000) reveals that the distribution of wealth is highly skewed to a minority population of very high-income earners and it appears that high income inequality is a feature of developing countries (the Gini Index for industrialised nations seldom reaches above 40).[2]

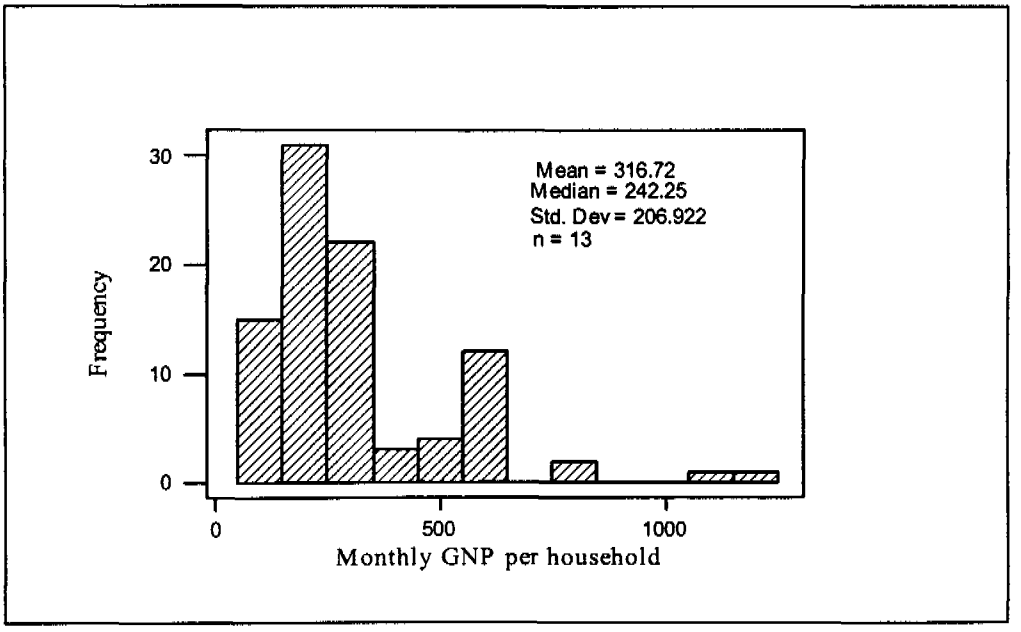
At a national level, the distribution of income among the group of developing countries may also be uneven. The distribution of per household Gross National Product (GNP) of the thirteen countries represented in the studies included in the meta-dataset is depicted by the histogram in *Figure 1*. The distribution is clearly skewed to the right indicating that even across households in the relatively limited range of developing countries included in these studies, aggregate income levels are widely dispersed. Mean GNP per household is US$316.72 (constant 1995 prices) but the median is only US$242.25. If planning is to be based on aggregate income data, then it is

[1] Classifications used here are based on the World Bank World Development Report of 1995.

[2] Sweden has an index of 25, the United States, 40 and the United Kingdom, 36.1 (World Bank, 2000).

important that a measure of spread is included in the analysis of the national data so that a better idea of the shape of the distribution can be obtained.

Figure. 1 ***Histogram showing the distribution of GNP per household across the 14 countries represented in the studies included in the meta-dataset***

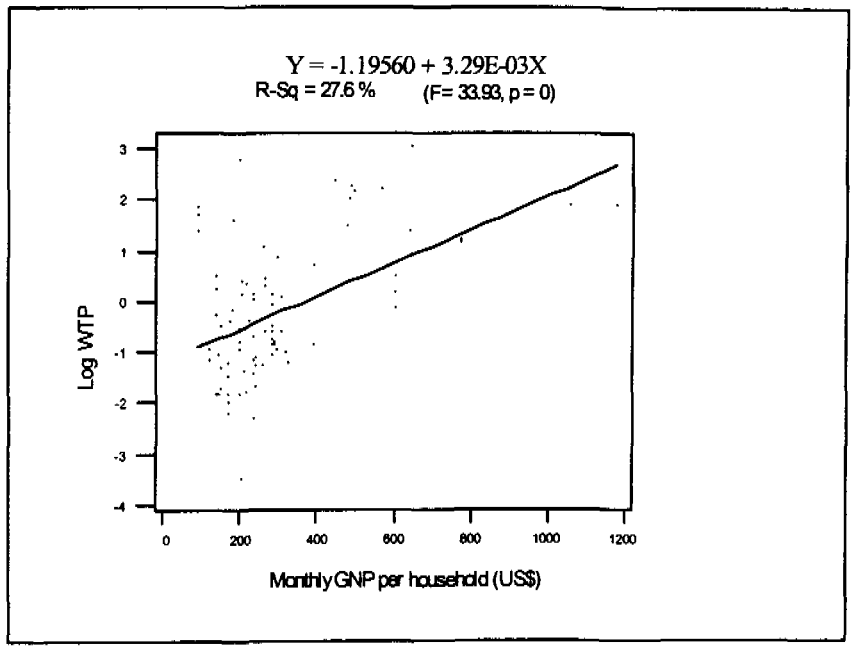


This preliminary finding suggests that it is perhaps inappropriate to base cost-recovery factors in water projects on general assumptions about what people can afford to pay, especially where these assumptions are based on aggregate national income data. Basing project decisions on aggregate income figures ignores the often highly skewed distribution of income towards a minority of high-income earners within countries and regions. This is particularly problematic when one considers that it is most often the poor majority who are the intended beneficiaries of water projects and who are thus least likely to be able to afford the costs of improved services.

A simple plot of log WTP for water services against GNP per capita further illustrates this finding (*Figure 2*). It shows the positive relationship between aggregate income and WTP but the regression correlation co-efficient indicates that the model does not fit the data very well (the R-squared is only 29%). Most of the observations display relatively low levels of GDP but there is wide variability about the best fit. The interpretation of the regression equation is that a ten dollar increase in monthly GNP per household will raise the WTP bid by 0.032 percent[1]. Thus a household currently paying US$1 per cubic metre of water would be willing to pay 32c more if GNP was raised to US$100 per capita. From the plot, one can also see that at low incomes some households appear to be prepared to pay relatively high amounts for improved water.

[1] Note that GNP has not been logged therefore the interpretation is one of a semi-log relationship (see Santos, 1999)

Figure.2 ***Simple regression plot of Log WTP against monthly GDP per capita***



Almost one third of the studies were conducted in sites located in arid regions[1] and only twenty per cent of the observations assessed the demand for water of households living in urban areas. The difference between the average WTP amounts across different features of the study site is statistically significant for all the tested features of the study site at a 1% (*Table 9*)

These preliminary observations demonstrate the need for more localised investigations of what people can actually afford to pay for their water services and what determines their willingness to pay. Simple descriptive statistics based on *ceteris paribus* conditions do not, however, provide sufficient evidence to either confirm or disprove the affordability rule-of-thumb as the important interaction components between income levels and other important determinants of WTP have not been considered. As mentioned earlier, the distribution of WTP bids are a function of several *actual* determinants, related to the features of the household under study and that particular household's preferences for different levels of service, as well as a function of a number of systematic and random error elements (related to the study design and conduct characteristics, the study site and any mistakes that may have entered the dataset in the interpretation and recording of responses or in the calculation of mean figures). All the systemic components should be accounted for before conclusive findings can be made.

1.4 *HOUSEHOLD CHARACTERISTICS*

The range of monthly household incomes across the studies spans from US$8.17 per month (constant 1995 prices) to US$212.86 with a standard deviation of US$60.13. Reported monthly household incomes of household

[1] Regions where rainfall is below 500 mm per year (*Times*, 1997).

samples within studies are also wide-ranging. In India, for example, household income varied from US$10.36 in Kerala district to US$212.86 in Punjab and both of the studies were conducted in rural areas[1].

The range in income may account for some of the variability in WTP bids. The mean monthly WTP for water services is US$2.1, with some samples willing to contribute as little as 3c per month towards the proposed service and others as much as US$21.62, more than twice the mean income levels of some samples. From an analytical viewpoint, variation in WTP estimates is desirable if it can be associated with variation in some independent variables. However, as mentioned earlier, this large variation could be an indicator of unreliable water benefit estimates. The WTP amount for the households in Ecuador was over US$21 per month and suggests that the estimate of the benefits of water to households in this rural community has been highly overstated, especially since it is mentioned (Hardner, 1996) that the community supports a non-cash based economy. Mean WTP as a percentage of mean monthly household income is around 4% which would appear to substantiate the five-percent affordability rule. However, when one examines the shape of the distribution of reported sample income (*Figure 3*) and compares it to the distribution of stated WTP (*Figure 4*), it is once again shown that this rule-of-thumb may not be generally applicable as the shape of WTP does not closely mirror that of income.

The distribution of WTP is highly skewed - most households are willing to pay small amounts for improvements in their water supplies. The distribution of income is highly variable (although some of this variation may be attributable to mistakes in estimation and calculation). The relationship between the two is shown more clearly by the scatter plot and best fit line of WTP as a function of monthly household income (*Figure 5*).

[1] It is possible that some of this divergence arises as a result of measurement error. Some of the studies reported income levels based on proxy indicators such as the number of visible assets (such as radios, refrigerators and television) observed in the homestead. In rural areas, wealth is not necessarily measured in this way especially where the infrastructure necessary to operate consumer durables is not accessible. Households may also have given incorrect estimates of their income levels where these fluctuate with seasons (being highest immediately after the harvest season *ceteris paribus*).

Figure.3 ***Histogram showing the distribution of mean monthly household income***

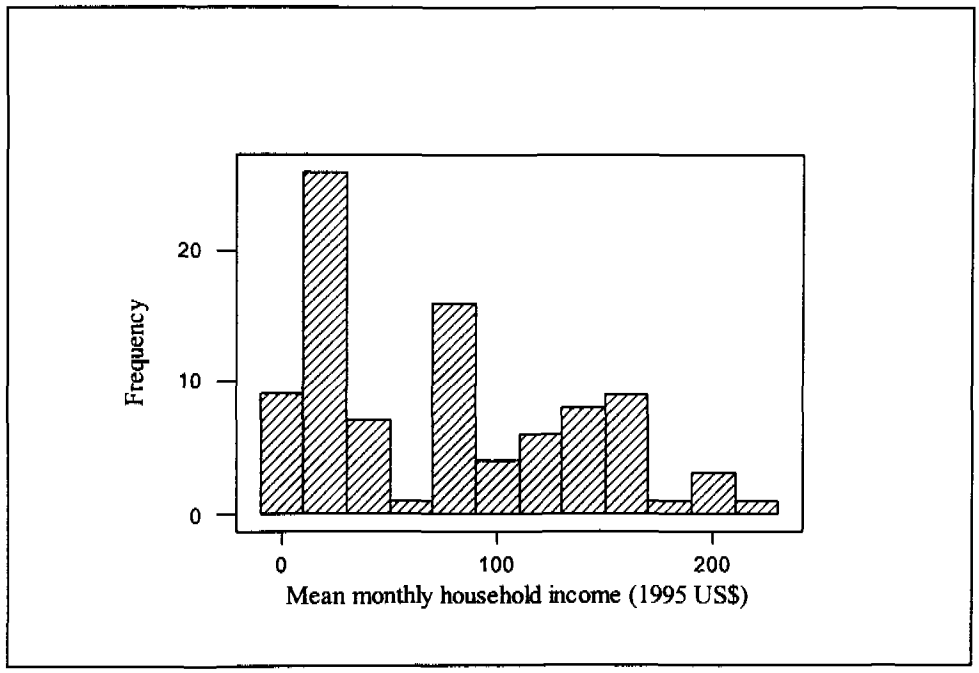


Figure.4 ***Histogram showing the distribution of household monthly WTP***

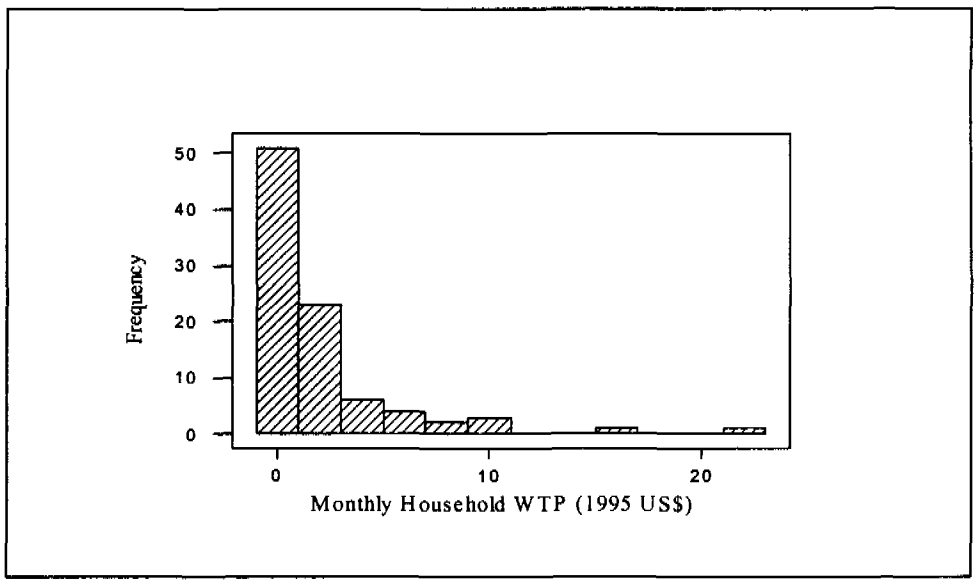
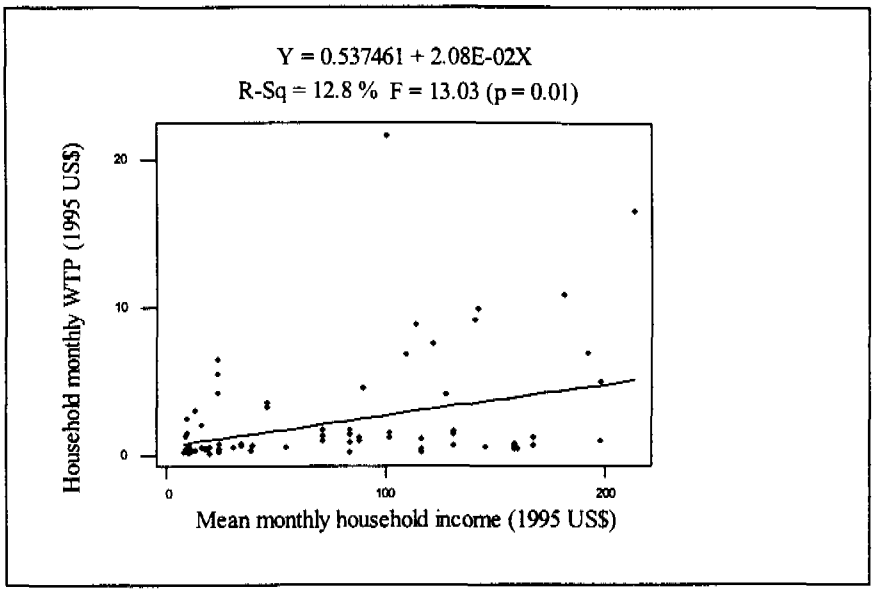


Figure.5 ***WTP as a function of monthly household income***



From *Figure 5* it can been seen that there is a positive relationship between WTP and income but the relationship is poor (R^2 is 12.8% and this fit is significant at the 5% level). Moreover, one can clearly see the variability in stated WTP about the best fit line and this variability appears to increase with income suggesting that demand for water is elastic at higher levels of income. Intuitively this would make sense as where income is low, households are likely to use water primarily for meeting their 'basic need' requirements and thus will pay a relatively high price for water below that margin. At higher levels of income, households may be using water for non-essential purposes (such as for the operation of consumer durables or for recreational purposes). Consumption above the level deemed 'adequate' for a reasonable standard of living is therefore more likely to be sensitive to price. Water consumption thus displays the properties of a normal good with diminishing marginal returns at higher levels of consumption. Since price and income are related (as the price of one good increases, the amount of income available to spend on other goods and service decreases, ceteris paribus) it can be postulated that water demand becomes more elastic as income increases and the use of water extends beyond that required for basic needs.

The regression equation of WTP as a function of income restates the above-mentioned findings statistically. It shows that even at zero levels of income, households value their water and are willing to pay 0.50 dollars for each extra unit of consumption or level of satisfaction associated with an improved quality of water. This is an interesting result and lends some weight to the argument that the DRA approach which suggests that even at low income levels can household payments can be forthcoming for services that match consumer preferences.

With every ten dollar increase in income, households are then willing to pay 20c more for each unit of consumption. Logging the relationship between WTP and household income allows one determine the income elasticity of

demand for water (the rate of change of WTP with respect to income) The log specification of the relationship yields the equation:

$$\ln Y = -2.22709 + 0.5403629 \ln X$$

Where Y is WTP (in US$) and X is household income (in US$).
In its simplest form, this reduced form regression provides a useful result to guide expectations and hypotheses about the implementation on cost recovery in certain low-income communities.

It shows that for every one percent increase in income, WTP increases by 0.54 percent. Thus, if income were to increase from US$10 per month to US$20 per month (that is, a 100% increase), then WTP would increase by 54 percent, *ceteris paribus*, suggesting that water is a relatively inelastic normal good.

Household size varies from 3 to 12 members with an inter-study mean of 7 members. It is difficult to say what the effect of this large mean will have on the predicted mean WTP as it was not possible to include variables to explain the gender and age composition of households. Most households in the sample would appear to have been educated to at least a primary school level with a mean of six years of schooling. No households had a mean of less than two years of schooling and the most educated households had, at most, senior school qualifications. The outcome of the Kruskal-Wallis test (*Table 10*) confirms the differences (at a five percent level or better) in WTP amounts according to the characteristics of the households in the samples.

1.4.1 *Water Service Characteristics*

Over eighty percent of the households in the meta-dataset were offered a new, as opposed to an improved, service and 56% of the bids were for private connections. Just over one third of the respondents were told that the recurrent costs for water would be worked out on the basis of their consumption levels and only two thirds were told that an upfront installation and connection charge would be expected from them. The median WTP was surprisingly higher among respondents offered an improved rather than a new water delivery system (*Table 11*). This may reflect current attitudes towards water provision particularly in countries such as South Africa where those currently using unimproved or traditional sources are often population groups who have been politically marginalised in the past and believe that it is now up to their now more representative governments to provide them with new services at no charge. It could also indicate a lack of awareness among respondents about the added benefits that a new service would bring over an upgrading of the systems that are currently in place. The results of the Kruskal –Wallis test (*Table 12*) do not, however, substantiate at any conventional significance level the difference in median WTP values between respondents offered new over improved systems.

As could be expected, the median WTP was higher among respondents valuing a private connection rather than a communal one, possibly indicating

that they have accounted for the opportunity costs associated with collecting water from distant sources. Suprisingly too, households were prepared to pay, on average, more for a flat rate than a volumetric rate. This may have come about if they did not understand how the volumetric system works or if they were opposed to paying the additional capital costs associated with the installation of an effective metering and charging system which requires efficient administration and management (Hazelton, 1997; Barrett and Sinclair, 1999). Households that were told that they would have to pay an upfront connection charge also provided lower median WTP values than those who were not. This may reflect the seasonal nature of income levels among agriculturally-based rural households or households relying on income from migrant labour. Often the cash will not be available as a lump sum, but if the payments are spread then households can factor this into their monthly budgets. The differences in WTP are significant across these factors at a ten percent or better level of significance (*Table 12*)

Regression Results

The structure of the data used in the meta-analysis is quite complex. WTP values are generated by different studies, carried out in different geographical locations and using different valuation formats. Following the lead of several earlier meta-analyses of environmental evaluation studies (Boyle *et al*, 1994; Espey *et al*, 1997; Alston *et al*, 2000 and Poole *et al*, 1998), the basic relationship between WTP and the explanatories can be specified as:

$$WTP = b_0 + Xb + v$$

Where b_o is the intercept, b is the vector of slope co-efficients, X is the matrix of explanatory variables included in the model and v is the error term. Apart from the continuous variables of education, household size and income, all explanatory variables are dichotomous dummy variables which indicate the presence or absence of particular characteristics.

As a preliminary step in specifying the model, the distributions of the continuous variables were investigated by plotting histograms. The reason for doing this was to assess whether or not any transformations were needed to normalise the distributions of the monetary variables if they were highly skewed and thus to linearise the relationship between the dependent variable (WTP) and it explanatories.[1] Given the shapes of the monetary variables, a logarithmic transformation was used and the predicted relationship became

$$\text{Log } WTP = b_o + Xb + v$$ [2]

[1] A more accurate method of testing for the necessity of transformations is to use the Box-Cox test. This involves scaling the observations on WTP so that the residual sum of squares (RSS) in the linear and log models are rendered directly comparable (Dougherty, 1992).

[2] The log specification of the model implies that the dependent variables should be interpreted as (1) an elasticity when the specification is log-linear (income) and (2) as a percentage effect on WTP of a small change in the independent variable when the specification is semi-log (all continuous variables except income). The parameter estimates for dummy variables are interpreted in terms of percentage effects on

The logged WTP values were then regressed onto the explanatory variables using ordinary least squares (OLS). The regression output is displayed in *Table 13*.

From the results in Table 13 it can be seen that over half of the data is accounted for by the model (the R-squared adjusted for degrees of freedom is 51.3%) and the probability that the goodness-of-fit arose purely by chance is very low (this is confirmed by the F-statistic which is significant below the one per cent level. Six of the explanatory variables are significant at the five percent level and a further two at the ten percent level. It is interesting note that not all the variables behaved as anticipated and to observe that the study site and design features are significant factors in explaining stated WTP. The results of the regression are explained more fully below.

The most significant factor influencing WTP is the location of the study site – that is, whether the sampled household was located in an urban or in a rural area. It was expected that bids would be higher in urban than in rural areas because of correlation with income and education levels and households living in close proximity may have learned of the benefits of an improved supply from their neighbours. They are thus more likely to understand the nature of the services being offered to them and are therefore more likely and willing to pay a higher amount for a new service. Also, households living in urban areas are more likely to be forced to pay for most of their water consumption or, where unimproved sources are available, they are likely to be heavily polluted.

The second most significant factor is climate, although the negative co-efficient is contrary to expectations. Intuitively, one would expect households living in arid climates to be willing to pay more for their water supplies because of the greater amount of time needed to collect water from naturally occurring sources. It can, however, be counter-argued that households living in low rainfall regions will already have invested large amounts of money in storage tanks and may have evolved sophisticated coping strategies (Nyong and Kanaroglou, 1999). Where large investments have already been made, households may be unwilling to allocate more income towards piped services.

Studies carried out after the publication of the NOAA guidelines also appear to have a significant influence on the WTP bids. This may be because respondents were provided with enough information (which they understood) to make an informed decision about the amount that they were willing to pay for the proposed service. The NOAA guidelines also recommend the use of closed-ended procedures which have consistently shown to produce significantly greater mean values than open-ended ones, possibly as a result of respondents' uncertainty in answering the latter (Bateman *et al*, cited in Brouwer *et al*, 1997).

WTP of a *ceteris paribus* change from 0 to 1 in each particular variable (Halvorsen and Palmquist, 1980; cited in Santos, 1999).

Neither the elicitation procedure nor the conduct method were significant at a ten percent level although the co-efficients suggest that using a stated preference approach would raise the WTP estimates by 66 percent with respect to revealed preference approaches and using an iterative procedure would lower estimates by 55 percent compared to using an open-ended format. It is unclear what effect an iterative bidding procedure would have on the responses *a priori* as using a bidding game provides respondents with benchmarks upon which to base their value estimates. Respondents who are faced with the interviewer might be tempted to inflate their responses in an attempt to 'comply' with the perceived expectations of the enumerator but using an iterative bidding game gives respondents an idea of the true expected value of the WTP bid thus reducing the likelihood of 'wild' estimates. The dichotomous choice format was developed to increase the incentive-compatibility of the valuation question (Brouwer *et al*, 1997) and matches the way consumers make choices in the market, giving respondents the proper incentives to reveal their 'true' preferences. The dichotomous choice format does, however, may induce what has been called 'starting-point bias', that is, the initial bid amount offered to respondents may influence their response. Since there is no consensus on which format (open-ended or closed-ended) is less biased, the divergence between formats is interpreted as a reliability problem.

Perhaps the most surprising result was the negative coefficient for education levels (significant at the five- percent level). One would expect that households with more years of schooling would have learned of the private and social benefits of improved water consumption. Furthermore, more-educated households are more likely to have members engaged in productive employment or to have a higher probability of finding employment, implying that the opportunity costs associated with collecting water from communal sources are also higher. It may, however, be the case that more educated households who are aware of the economic and social benefits of improved water services, will already have invested in higher quality, more convenient supplies and thus do not see the need to spend more money on improving supplies when they are satisfied with their existing arrangements. Whittington *et al* (1992b), based on an analysis by Hoehn and Randall (1987) note that one could expect that applying CVM to rural households with limited education would increase the frequency of incomplete responses and therefore potentially increase the importance of strategic considerations linking their informed values to their stated values.

In order to assess whether there was any correlation between income and education, education and location and income and location, the Pearsons correlation co-efficient was calculated for each of these relationships. The results are presented in *Table 14*.

From the results it can be seen that there is no significant correlation between locality and education although it is interesting to note the negative co-efficient which suggests that education tends to be higher in rural areas than

in urban ones. The small number of studies that were conducted in urban areas may be a cause of this counterintuitive result. The high significance of the other tested relationships suggests that there is a positive relationship between income and education and also between locality as income. This is as one would expect.

Another interesting observation with important repercussions for the application of the five-percent rule in water service planning is that income was not the main determinant explaining the variability of the WTP bids although it is significant at the five- percent level. Holding all factors constant, a one per cent increase in income will result in a thirty-five percent increase in WTP for water, making the income elasticity of demand fairly elastic. Controlling for the effects of systematic error, income is nevertheless one of the most important determinants of demand. If it is argued that income levels and education enjoy a reciprocal relationship and that income levels are most often a function of rurality, then it is clear that income is a key factor in explaining WTP. The variability in the WTP bids across studies could thus be largely attributed to variations in income levels and thus accords with the preliminary evidence from the descriptive statistics and the skewed-income patterns within countries.

Although the goodness-of-fit of the full model was reasonably high (R-sq. is 59.4%), a stepwise procedure was run to see whether the fit could be improved any more by sequentially removing those variables having the least explanatory power and then finding the combination of variables that yields the best fit. Two procedures were run, one in which all the variables that were significant at the ten per cent level or better were forced into the model and then another using all variables significant at the five percent level or better. The results of these procedures are displayed in Appendix ??. Neither of the procedures improved the goodness-of-fit of the model and the best combinations of explanatory variables included all the variables that were used in the full model. Thus all tested variables add some explanatory power to the model even if only through second-order interactions.[1].

The results of the OLS regression do not, however, provide conclusive statistical evidence about the factors influencing real WTP. The structure of the data used in the meta-analysis is quite complex. WTP values are generated by different studies, carried out in different geographical locations and using different valuation techniques. Using the summary statistics of these different studies in a pooled sample, the usual conditions required for Ordinary Least Squares (OLS) are likely to be violated. Two types of potential problems with the regression errors that might affect the OLS estimates are considered. First, the nature of the data may give rise to heteroskedasticity where the standard

[1] Omitting variables can also introduce bias. If explanatory variables that should have been present in the regression are omitted, and if these omitted variables are correlated with any of those that are included, then the co-efficients on the included variables will be incorrect (Koop, 2000). Nevertheless, the counter-argument can be made for using as *few* explanatory variables as possible. It can be shown that the inclusion of irrelevant variables decreases the accuracy of the estimation of all the co-efficients (Koop, 2000).

deviations of the errors differ across observations. There are three main reasons why this should occur:

(1) variation within studies due to measurement error (inaccurate recording of information by enumerators and mistakes in the calculation of mean sample values);
(2) inter-study variation (as a result of the diverse methodologies employed); and
(3) sample size discrepancies (mean WTP bids are likely to be more representative of the total population where the sample size is greater. The observation sample sizes across the studies in the meta-dataset ranged from 13 to 968 and thus it could be argued that greater weight should be attached to the values obtained from the larger sample sizes.

From a precursory overview of the meta-database it appears that the small sample sizes correspond to sub-samples or independent observations within the studies. That is, small sample sizes generally correspond to independent observations taken from villages or from sub-sectors of the study population whereas the large sample sizes usually correspond to studies where one observation was made for an entire district or region. Considering the 'scope test', there is little reason for the large sample sizes to be any more representative of their study populations than the smaller ones are of theirs: the proportion of the sample populations to the true populations could be approximately equal across studies[1].

Poe *et al* (2000) suggest that instead of treating each unique value as an equally weighted observation, each study could be given equal weight so that a study with twelve observations would have equal weight as a study that provides only one or two observations. Adopting an equal weight approach across studies dilutes the effects of additional within-study variations (Poe *et al*, 2000). Since each observation was treated as an independent sub-sample it was not considered necessary to adopt such an approach.

Commentary

Amid growing evidence that many urban and rural communities are willing to pay more than the prevailing rates for water to ensure a better or more reliable service, it is clear that there is great potential for cost recovery in the water services sector. In order for full cost recovery to be a viable target in water project planning, however, it is important for planners to understand the multiple factors that influence demand for each level of service and for communities to be provided with the services that meet their particular preferences and for which they are willing to pay.

In this light, project planners and policymakers recognised the need for the development of research tools to assess households' WTP. The CVM is by far the most widespread in the water sector as it is believed to offer the most reliable estimates for *new* services when it is carefully designed and

[1] It was mentioned before that many studies did not indicate the 'scope' of their studies and so it is difficult to assess the representativeness of the sample, *ceteris paribus*.

administered. In the last decade, a substantial body of work on WTP for water has accumulated and a wide range of WTP estimates has emerged. Traditional narrative reviews often based on a core selection of studies have attempted to account for the variability by noting that the different values attached to water by communities and households reflects their environmental, socio-economic and cultural circumstances. Allowing for these differences among respondents, the conventional wisdom became that households would be willing to pay for new service as long as the costs did not exceed 5 five per cent of household income.

In this paper, an attempt has been made to deconstruct the CVM results obtained from the wide-ranging body of literature on WTP for water in developing countries by complementing a qualitative descriptive analysis with a quantitative meta-analysis. An integral part of the meta-analysis is the assembly of the studies and the creation of a database using the information provided in the studies. In order for a full analysis of the reasons for variability in the estimates to be made, it is important that results are incorporated from as wide a range of studies as possible, as the results of both the qualitative and quantitative analyses here reveal how the quality and characteristics of each particular study, in terms of design, elicitation and study site, have significant first-order effects on respondents' stated WTP. A comprehensive analysis of the literature can thus provide a basis for understanding *why* WTP values differ among studies. By accounting for systematic differences arising because of different study methodologies, enumerator eccentricities and recording techniques, and random calculation error, closer estimate of *actual* WTP can be obtained.

The results of the meta-analysis show that demand assessment for cost-recovery is a more complex issue than commonly believed. For water policy and planning to proceed soundly, actual policy benefits need to be weighted against costs as part of the process of evaluating this policy. As far as public preferences for water services are recognised as a policy- or project-evaluation criterion, formal cost-benefit analysis provides a useful tool to make these cost-benefit comparisons in an explicit and straightforward way. In cost-benefit analysis, the benefits from water services are measured as WTP for water service improvements.

The impracticability of conducting micro-level surveys for each policy- and project-decision has prompted researchers to investigate other means of assessing demand. Benefit transfer is receiving widespread attention in environmental valuation literature but the potential of the approach has not yet been realised in practice because of a lack of transferability of the benefit estimates. In order for benefits to be reliably transferred, the transfer sites should exhibit near-identical conditions. Since this is rarely the case, researchers have been cautious about advocating the method as a valid means of evaluating evironmental goods and services.

These findings underscore the need for a greater understanding of the nature and determinants of demand. WTP studies clearly provide information which

could help in technical planning and link investment decisions with pricing policies. It is recognised that it is impracticable to carry out a new study for every single policy but benefit transfer offer a potentially practical solution. However, the transfers need to be informed by a sound set of input data. In compiling the data for the meta-analysis, it became clear that, despite the NOAA guidelines and the influence of experienced research teams in conducting household surveys, there are still wide discrepancies in the quality and level of detail that is recorded in the report.

The technique of meta-analysis would appear to offer a useful way of informing a demand-responsive approach to water service planning. The impracticability of conducting detailed micro-level surveys for the purposes of evaluating the costs and benefits of each policy and project provides a strong argument for the development of methods that allow for the transferability of research findings. The high variability in characteristics and the complex interactions that occur within and between communities makes it difficult, however, to replicate sites suitable for a benefit transfer. If such a method is to be proposed as a valid means of inferring estimates from one community or one household to another, then a systems approach needs to be adopted wherein the complex relationships between first and lower-order determinants can be modelled and estimates reliably inferred.

This argument is strengthened when one sees that a significant degree of the variability in WTP estimates across the studies is attributable to the particular methodologies that were used to solicit responses. Nevertheless, the wide-ranging nature of income levels both within and between studies suggests that it would be unreasonable to expect households to pay for water services that they either do not want (because they have already 'solved' their water problems and are satisfied with their current supplies) or that they cannot afford.

The high failure rate of so many water supply projects in the last decade demonstrates the drawbacks of making general assumptions about what people are willing or able to pay for their resources. Despite the incomplete nature of the meta-analysis that was conducted here, it is clear that *actual* WTP for water is a function of the locality of the household, the natural availability of the resource, knowledge about the benefits that higher service levels will bring and the amount of money that has already been invested in improving supplies. It could reasonably be argued that each of these factors is related to income in some way and therefore that it is ultimately income that drives the demand for water.

Once further analysis has been made, the potential for benefit transfer can be more reliably assessed, but what is clear from the studies collected for the meta-analysis, is that there needs to be some standardisation in the way in which CVM surveys are carried out or, at least, researchers need to make explicit their assumptions and inferences. Although it is understood that CVM studies are undertaken to serve particular research agendas and thus results are often presented selectively, if water project planning policy-making is to

be based on the outcomes of these surveys then a higher level and quality of reporting needs to be encouraged. One way of improving the reliability and validity of the meta-analysis outcome, would be to access the full range of information collected by the authors, where this information is still available.

The database that was assembled here is ripe for further analysis and suggestions have been made about where further progress in the analysis could start. The use of a generalised linear modelling procedure that accounts for heteroskedasticity and can be implemented on a multi-level scale to allow for different study and within-study sample sizes and for the non-independence of all observations within a study, would permit a more rigorous analysis of variation and a more reliable estimate of the benefits of improved water to the respondents themselves.

1.5 *THE CONTINGENT VALUATION METHOD*

The contingent valuation method (CVM) is a survey technique[1] that attempts direct elicitation of individuals' (or households') preferences for a good or service. It does this by asking the respondents in the survey a question or a series of questions about how much they value the good or service. People are asked directly to state or reveal what they are willing to pay to gain or avoid some change in provision of a good or service; and/or what they are willing to accept to forego a change or tolerate a change.

A contingent market defines the good itself, the institutional context in which it would be provided, and the way it would be financed. The situation the respondent is asked to value is hypothetical (hence, contingent'), although respondents are assumed to behave as if they were in a real market. Structured questions and various forms of bidding game' can be devised involving yes/no' answers to questions regarding maximum willingness to pay. Econometric techniques are then used on the survey results to find the mean bid values of willingness to pay.

Over the last two decades interest in CVM has increased for a number of reasons (see Carson 2000). First, a stated preference approach is the only means available for valuing 'non-use' (or passive use) values, such as people's existence values for a unique natural habitat or wilderness area. Second, the evidence available suggests that estimates obtained from careful and well-designed, properly executed surveys appear to be as good as estimates obtained from other methods. Thirdly, the design, analysis and interpretation of surveys have improved greatly with advances in scientific sampling theory, benefit estimation theory, computerised data management and public opinion polling.

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1 For a detailed review of the Contingent Valuation Method, see Mitchell and Carson (1989) and Carson (2000).

In developing countries CVM has been applied widely in the field of WSS planning. The complex range of WSS benefits means that the method is an appropriate form of inquiry for eliciting community preferences for as yet hypothetical supply options. But the hypothetical format of the approach is also the root of existing criticisms of the method. Interestingly the method is convergent with the DRA agenda, which requires the elicitation of household willingness to pay.

1.5.1 *Design of a CV study*

In designing a CVM study, one has to answer a number of questions relevant to contingent valuation research in general. These include:

- What change in service provision or quality should respondents be asked to value, and how should this change be described to them?
- What type of interview format should be used in the survey (i.e. face to face, telephone, or mail)?
- What type of questions (elicitation procedure) should be used to elicit respondents' valuation of the change in provision?
- Exactly how should respondents be told that they would have to pay for the change in provision?
- How can we increase our confidence that respondents in the contingent valuation survey are actually valuing the specific change in service quality described and not some other environmental quality change, and furthermore, that the values found are correct?

There is an extensive literature on designing CV surveys including a review of application problems in developing countries (Whittington 1998). Two application problems seem to stand out. The first relates to the potential disparity between willingness and ability to pay (see section). The second is the fact that in considering the level of service to offer a community it is somewhat difficult to breakdown the drivers of demand (WTP) using CVM. In other words, considering the service offered to a community as a bundle of attributes (e.g. quality, volume, distance, price), CV might let us know how a household values a particular combination of attributes, but it is less able to reveal the WTP for spefic attrinutes in isolation.

Table 1 : The determinants of demand for new and improved water supplies

CROSS-REFERENCE FACTORS AND FACTOR LEVELS			
Variable	**Description**	**Expected Sign**	**Hypothesis**
Sample Population Characteristics			
Household Size	Continuous variable measuring the number of people in a household. Children younger than 12 years of age are usually counted as half-adults	?	• The relative need for 'basic needs' water is greater per household where there are more members therefore WTP for water is likely to be higher *ceteris paribus*. • The more family members there are, the more labour there is available for collecting water therefore WTP for new or in-house connections is lower, *ceteris paribus*.
Proportion of Adult Females	An index of the number of adult females in the household as a percentage of total adult members	?	• Most household activities which require water (washing, cooking) are performed by women and they are also most likely to be familiar with the health benefits of higher quality supplies. They are also usually the ones who have to collect water and would thus place a higher value on a more convenient source. • Since fetching water is often a women's chore, the more women in the household, the more labour is available for collecting water, hence WTP for new services will be lower, *ceteris paribus*..
Number of Children	A continuous variable showing the number of children in the household who are strong enough to assume water-related responsibilities such as fetching and carrying	-	• The greater number of children in the household who can assume water collection responsibilities, the lower the opportunity costs of fetching water and hence the lower the value placed on more conveniently located supplies, *ceteris paribus*.
Monthly Household Income	A continuous variable measuring the total average income earnings of the household during one month	+	• Microeconomic theory of consumer behaviour shows demand to increase with income, *ceteris paribus*, and where water is a normal good.
Assets/Wealth	A continuous proxy indicator of income measured by observation of a pre-specified set of consumer durables	+	• As above, the relative wealth of a household is likely to be a reflection of the amount of money available for spending on improved services, *ceteris paribus*.
Tenure	A dichotomous variable to indicate whether the family rents or owns their present dwelling (1 = owner)	+	• Families that own their homes are more likely to be willing to invest in their properties and thus will pay more for a domestic connection, *ceteris paribus*.

CROSS-REFERENCE FACTORS AND FACTOR LEVELS			
Variable	**Description**	**Expected Sign**	**Hypothesis**
Landlord in house	Dichotomous variable to indicate whether or not the landlord lived on the property (1 = landlord lives on property)	+	• Where the landlord is present on the property, respondents may feel that it should be the responsibility of the landlord to invest in piped supplies and will therefore be less willing to contribute, *ceteris paribus*.
Education	A continuous variable measuring the mean years of schooling of the household	+	• Households with higher mean years of schooling are more likely to have been educated in the benefits of water consumption for hygiene purposes and thus will be willing to pay more for the resource, *ceteris paribus*. • Households with higher education also tend to face higher opportunity costs for collecting water (their labour has potential to earn higher returns elsewhere) and so will pay more for a convenient water service, *ceteris paribus*.
Occupation	A dichotomous variable to indicate whether the household is involved primarily in market-gardening/trading activities or whether main income earners have professional jobs or not (1 = office jobs and 1 = agricultural/petty trading)	+	• Households where the main income earners are involved in office-based activities are likely to have higher income levels and face higher opportunity costs and will therefore be willing to pay a higher price for new services, *ceteris paribus*. • Where the household is primarily subsistence based or petty-commodity production based, and where these activities take place around the home, the greater amount of water will be required and thus its marginal value will be higher, *ceteris paribus*..
Respondent Characteristics			
Age	Continuous variable measured in years	-	• Older respondents who have traditionally obtained water from unimproved, "free" resources may dislike the idea of having to pay for water and thus will offer a lower WTP bid, *ceteris paribus*.
Head of Household	Dummy variable measuring whether or not the respondent was the head of the household (1 = household head)	?	• Where the respondent is the head of household he/she is likely to have control over the household budget and will thus know how much money is available for spending on new or improved supplies.
Gender	A dummy variable to specify whether the respondent was male or female (1 = male)	–	• Where the head is a female, and is thus usually more involved with water-using activities around the house, WTP is likely to be higher, *ceteris paribus*.

CROSS-REFERENCE FACTORS AND FACTOR LEVELS			
Variable	**Description**	**Expected Sign**	**Hypothesis**
Water Supply Characteristics			
Satisfaction with existing source	An index to express the degree of satisfaction of the household with its existing services in terms of reliability, physical quality of water and convenience. Sometimes recorded as a referendum dummy (ie yes/no)	–	• Where households are satisfied with their current quality of supply (physical attributes, convenience and reliability) they will value new or improved supplies less highly than a household that is dissatisfied with current service levels, *ceteris paribus*.
Existing expenditure on water	A continuous variable to measure the amount of money that the household is currently spending on obtaining water	?	• the price of the new/improved scheme and perceived opportunity costs saved with respect to added convenience and reliability will largely determine the household's preferences for a new level of service.
Storage Capacity	Usually expressed as a dichotomous variable to show the ability of the household to collect and store water in times of relative plentiful supply (during the rainy season) (1 = capacity to store > 500 gallons of water)	–	• The greater amount of storage space the house has to collect water and store it for long periods of time, the less valued a convenient source of water is likely to be, *ceteris paribus*.
Vending	A dummy variable to indicate whether or not the household purchases water from vending distributors or kiosks to supplement other possible supplies (1 = vendor is primary source)	?	• The presence of vending activities has an ambiguous effect on WTP. Where proposed services can match the convenience and quality of vended supplies then and where the price of the proposed project water is similar to that of purchased water, then WTP is likely to be higher. WTP is this likely to relatively high for private connections, *ceteris paribus*. • Where the proposed service offers no added convenience and is priced higher than current supplies, then WTP is likely to be lower, *ceteris paribus*.
Distance from Source	Variously expressed as either a dichotomous or a continuous variable to indicate the distance in metres of the household from its primary source of water (1 = distance is > 200m where a dummy variable)	+	• The further away from the water source the household is, the more likely a higher value will be placed on more convenient and reliable services, *ceteris paribus*.
Time spent collecting water	A continuous variable to measure the time (in minutes) that the household spends in collecting water each day	+	• One would expect WTP for more-conveniently located and reliable supplies to be greater, *ceteris paribus*, where the amount of time spent collecting water is currently large

Characteristics of service offered	A dummy variable indicating whether the service offered was for a piped in-house connection or a public service (1 = in-house connection)	+	• Higher values are likely to be placed on private as opposed communal supplies because of the added convenience and quality.
Attitude to water provision			
Government responsibility	Dummy variable to indicate whether the respondent believes that the provision of water services is the responsibility of the public sector (1 = government should provide services)	–	• Households believing that water is a basic human right and that its supply is the responsibility of government are less likely to invest in improving supplies, *ceteris paribus*.
Metering	Dummy variable to show whether the household agrees with the concept of being charged for water or whether it should be provided free of charge (1 = agree with charging principles)	+	• Where households agree with the concept of being charged for water, their stated WTP for water is likely to be higher than those who believe that water should be provided free of charge, *ceteris paribus*.

Table 2 ***Studies included in the analysis***

Author	Publication Details	Year of Study	Study Site	Number of Observations
Goldblatt	*Geoforum* , 1999	1994	Johannesburg, South Africa	2
Boadu	*Journal of Agricultural Economics*, 1992	1991	Ghana	12
Whittington, Lauria, Wright, Choe, Hughes and Swarna	*Water Resources Research*, 1993	1989	Kumasi, Ghana	1
Whittington, Davis and McClelland	Paper prepared for submission to *Water International*, 1998	1994	Lugazi, Uganda	8
Whittington, Lauria and Mu	*World Development*, 1991	1987	Onitsha, Nigeria	1
Whittington, Smith, Okorafor, Okore, Liu and McPhail	*Journal of Environmental Economics and Management*, 1992	1989	Anambra, Nigeria	4
Whittington, Okorafor, Okore and McPhail	*Water Resources Research*, 1990	1989	Anambra, Nigeria	6
Wasike and Hanley	*Water Resources Development*, 1998	1995	Webuye, Kenya	4
McPhail	*Journal of Water Resources Planning and Management*, 1993	1990	Rabat, Morocco	1
McPhail	*World Development*, 1993	1990	North central Morocco	5

Author	Publication Details	Year of Study	Study Site	Number of Observations
McPhail	*Land Economics*, 1994	1990	Tunisia	1
Singh, Ramasubban, Bhatia, Briscoe, Griffin and Kim	*Water Resources Research*, 1993	1988	Kerala, India	3
Griffin, Briscoe, Singh, Ramasubban and Bhatia	*World Bank Economic Review*, 1995	1988	Kerala, India	3
Ramasubban	DFID/RWSG-SA report on a Workshop on Willingness to Pay for Drinking Water Supply and Sanitation, 1997	1988	Kerala, India	3
Reddy	*Development and Change*, 1999	1993	Rajasthan, India	6
Anand and Perman	*Journal of International Development*, 1999	1996	Madras, India	1
Asian Information Marketing and Social Research	DFID/RWSG-SA report on Willingness to Pay for Drinking Water Supply and Sanitation, 1997; originally part of a study on WTP for Improved Water Supply, Sanitary Latrines and Sewage Systems for Rural Households commissioned by the Punjab Public Health and Engineering Department, Patiala and the World Bank, 1996	1996	Punjab, India	1
Vaidya	DFID/RWSG-SA report on Willingness to Pay for Drinking Water Supply and Sanitation, 1997	1996	Baroda, India	1
Altaf, Whittington, Jamal and Smith	*Water Resources Research*, 1993	1988	Punjab, Pakistan	12
Altaf, Whittington, Jamal and Smith	*UNDP-World Bank Water and Sanitation Report*, 1992	1988	Punjab, Pakistan	12
Altaf	*Third World Planning Review*, 1994	1989	Punjab, Pakistan	3
Altaf	*Habitat International*, 1994	1990	Gujranwala, Pakistan	2
North and	*Water Resources*	1978	Bicol,	3

Griffin	*Research*, 1993		Philippines	
Author	**Publication Details**	**Year of Study**	**Study Site**	**Number of Observations**
Bohm, Essenburg and Fox	*Water Resources Research*, 1993	1987	Philippines	5
Briscoe, de Castro, Griffin, North and Olsen	*World Bank Economic Review*, 1990	1987	Brazil	9
Whittington, Briscoe, Mu and Barron	*Economic Development and CulturalChange*, 1990	1986	Southern Haiti	2
Aguilar and Sterner	Paper prepared for the Unit for Environmental Economics, Göthenburg, Sweden, 1995	1993	Limon, Costa Rica Guanacaste, Costa Rica	2
Hardner	*Water Resources Bulletin*, 1996	1995	Ecuador	1

Table 3 ***Number of observations from studies***

Number of Observations	Number of Studies
1	8
2	4
3	4
4	2
5	2
6	2
7	0
8	0
9	1
10	0
11	0
12	2
Total: 91	Total 25

Table 4

Variable	Variable Description	Mean (Standard Deviation)	Minimum	Maximum
Study Design and Site Characteristics				
Date	1 = study was carried out after 1993	0.2747 (0.4488)	0	1
Authors	1 = Whittington was on research team or the author of the study had worked with him on an earlier WTP study	0.5934 (0.4939)	0	1
Sample Size	Number of households	179.9	13	968

Variable	Variable Description	Mean (Standard Deviation)	Minimum	Maximum
	interviewed in each observation	(193.9)		
Region	1 = middle-income; 0 = lower income	0.3187 (0.4685)	0	1
Climate	1 = arid climate; 0 = humid climate	0.3187 (0.4685)	0	1
Locality	1 = urban; 0 = rural	0.2143 (0.4024)	0	1
Conduct Method	1 = contingent valuation methodology/stated preference	0.8956 (0.3029)	0	1
Elicitation Procedure	1 = bidding game was used	0.7363 (0.4431)	0	1
Time-to-Think	1 = respondent was not given time to think	0.9754 (0.1492)	0	1
Household and Respondent Characteristics				
Household Size	Mean number of people living in the household	6.848 (2.102)	3.16	12.010
Education Level	Mean number of years of schooling of the household	6.135 (1.985)	2.128	9.000
Household Income	Mean monthly household income in 1995 US$	73.88 (60.13)	8.17	212.86
Log Income	Log of monthly household income	3.837 (1.072)	2.1	5.361
Water Supply Characteristics				
Service Type Offered	1 = new; 0 = improved	0.8131 (0.3766)	0	1
Level of Service bid for	1 = private connection	0.5636 (0.4908)	0	1
Recurrent Cost Charging Arrangement	1 = respondents were told that the charging system would be based on volume of water used per month	0.3516 (0.4801)	0	1
Connection Cost Arrangement	1 = respondents were told that an installation charge would be levied and that it would be required as an upfront payment	0.6703 (0.4727)	0	1
Dependent Variable (WTP) Characteristics				
WTP bid	Mean monthly bid of all households in the observation in 1995 US$	2.077 (3.507)	0.030	21.620
Log WTP		-0.154 (1.296)	-3.507	3.074
WTP as a % of income	Mean WTP as a % of mean monthly household income	3.969 (5.850)	0.086	27.958
Log WTP as a % of income		0.614 (0.605)	-2.453	3.331

Table 5 ***Summary statistics by study characteristics***

STUDY CHARACTERISTIC	MEDIAN WTP (1995 US$)	N
Date		
Pre-1993	0.62	66
Post-1993	0.7	25
Authorship		
Whittington included	1.075	54
No Whittington influence	0.44	37
Conduct Method		
Contingent Valuation Methodology	0.91	81
Revealed Preference	0.3	10
Elicitation Procedure		
Open-ended	0.55	24
Closed-ended	0.7	67
Time-to-think	0.17	2
No time to think	0.735	89

Table 6: ***Results of the Kruskal-Wallis test for study design and elicitation factors***

Hypothesis	Date		Author		Conduct Method*		Elicitation Procedure		Time-to think*	
	H	*p*	H	*P*	H	*p*	H	*P*	H	*p*
H_0: equality of average WTP in all groups	0.65	0.418	4.53	0.033	15.67	0	0.65	0.42	4.76	0.093

*One or more small samples

Table 7: Studies by income band and number of observations

Country	Gini Indicator[1]	Number of Studies	Number of Observations	Median WTP 1995 US$
Low Income				
Ghana	32.7	2	13	0.43
Kenya	44.5	1	4	1.03
Nigeria	50.6	3	10	0.16
Pakistan	31.2	5	17	0.94
India	37.8	3	12	0.6
Haiti	-	1	2	0.35
Lower Middle Income				
Morocco	39.5	2	6	8.91
Tunisia	40.2	1	1	4.04
Philippines	46.2	2	8	0.4
Costa Rica	47	1	2	3.33
Ecuador	43.7	1	1	21.62
Upper Middle Income				
South Africa	59.3	1	2	6.82
Brazil	60	1	9	1.63

Table 8 Summary statistics by study site

CHARACTERISTIC	MEDIAN WTP (1995 US$)	N
Region		
Lower income	0.53	62
Middle income	1.63	29
Locality		
Urban	5.16	21
Rural	0.53	70
Climate		
Arid/semi-arid	1.04	62
Humid	0.44	29

Table 9 Results of the Kruskal-Wallis Test for study site features

Hypothesis	Region (low or middle income)		Locality (urban or rural)*		Climate (arid or humid)	
	H	*p*	H	*p*	H	*p*
H_o: equality of ave WTP in all groups	15.89	0.000	19.42	0.000	10.64	0.001

* one or more small samples

Table 10 Results of the Kruskal-Wallis test for household characteristics

Hypothesis:	Household Income		Household Size		Education	
	H	*p*	H	*p*	H	*p*
H_o: equality of ave WTP in all groups	73.11	0.007	67.75	0.001	67.66	0.000

[1] Source: World Bank World Development Report, 2000. The Gini co-efficient is an indicator of the degree of income inequality based on the Lorenz curve which related income to the percentage of income recipients in different income brackets. If income is equally distributed then the Lorenz curve is a 45 degree line such that 100% of the population is earning 100% of the income. Where this is not the case, the Lorenz curve will lie below the 45 degree line. The coefficient is the quotient of the area between the 45 degree (perfect equality) line and the Lorenz curve and the total area under the perfect equality line (Todaro, 1994). Thus the higher the quotient the more unequal the distribution of income.

Table 11 ***Summary statistics of the proposed water supply characteristics***

CHARACTERISTIC	MEDIAN WTP (1995 US$)	N
Service level offered		
New	0.55	76
Improved	1.04	15
Service type		
Private	1.21	53
Communal	0.53	38
Proposed tariff system		
Flat rate	0.74	32
Volumetric	0.55	59
Connection charge arrangements		
Upfront	0.57	30
Amortised/ not mentioned	0.90	61

Table 12 ***Results of the Kruskal-Wallis test for water service characteristics***

Hypothesis	Proposed Change (new or improved)		Service Level (Private or communal)		Tariff System (Flat or volumetric)		Connection Charges (upfront or implicit)	
	H	*P*	H	*p*	H	*p*	H	*p*
H_o: Equality of ave WTP among groups	7.50	0.277	7.14	0.068	6.3	0.012	4.73	0.03

Table 13

Explanatory Variable	Description	Co-efficient (Standard Deviation in Parentheses)	T-Statistic	P value
Constant		-2.577 (1.195)	-2.16	0.034
Date	Dummy: 1= after 1993; 0 = otherwise	0.8332 (0.3305)	2.52	0.014
Authors	Dummy: 1 = Whittington involved in study; 0 = otherwise	0.3333 (0.2855)	1.17	0.247
Region	Dummy: 1 = middle-income country; 0 = low-income country	0.7689 (0.4391)	1.75	0.084
Locality	Dummy: 1 = urban; 0 = rural	1.2184 (0.3093)	3.94	0.000
Climate	Dummy: 1 = arid/semi-arid; 0 = tropical/temperate	-1.3040 (0.4461)	-2.92	0.005
Conduct Method	Dummy: 1 = CVM; 0 = otherwise	0.6646 (0.5872)	1.13	0.261
Elicitation Procedure	Dummy: 1 = Closed ended; 0 = open-ended	-0.5098 (0.3142)	-1.62	0.109
Time-to-think	Dummy: 1 = respondent was not given time to think	0.6505 (0.7214)	0.90	0.370
Household Size	Continuous: number of people	0.12446 (0.07538)	1.65	0.103

Explanatory Variable	Description	Co-efficient (Standard Deviation in Parentheses)	T-Statistic	P value
	in household			
Education	Continuous: mean number of years schooling of household	-0.14675 (0.06555)	-2.24	0.028
Service level offered	Dummy: 1 = new; 0= improved	-0.1879 (0.2882)	-0.65	0.517
Proposed System	Dummy: 1 = private; 0 = communal	-0.0604 (0.2814)	-0.21	0.831
Proposed Charging Arrangement	Dummy: 1 = volumetric: 0 = flat rate	-0.5206 (0.3048)	-1.71	0.092
Connection charge Information	Dummy: 1 = charges amortised into recurrent cost tariff; 0 = respondent was told that up-front payment would be required	0.1960 (0.2788)	0.70	0.484
Log of income	Continuous: log of income measured in 1995 US$	0.3488 (0.1673)	2.08	0.041

N = 91 R-Sq. = 59.4% R-Sq. (adj.) = 51.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	15	89.7459	5.9831	7.32	0.000
Residual Error	75	61.3334	0.8178		
Total	90	151.0793			

Table 14 ***Results of the Pearsons Correlation Test***

Variable combination	Correlation co-efficient	p-value
Income // Education	0.266	0.031
Locality // Education	-0.103	0.332
Locality // Income	0.322	0.002

Annex E

Cost Recovery in Water and Sanitation Projects- Lessons from India

E1 COST RECOVERY IN WATER AND SANITATION PROJECTS – LESSONS FROM INDIA

1.1 INTRODUCTION

In November 2001 as part of the KAR project, ERM met with key WATSAN stakeholders in India to discuss the research themes of the project and the issue of cost recovery in water and sanitation projects, more generally, in India.

1.1.1 *General Background to WATSAN Cost recovery in India*

A report by the UNDP - World Bank Water and Sanitation Programme South East Region entitled *"Water for India's Poor – who pays the price for broken promises?"* neatly summarises the differences between political promises and the reality regarding water supply in India. Another paper, *"Willing to pay, but unwilling to charge"* also summarises the political obstacles within India to decentralising water and sanitations services and charging consumers. Together, they usefully frame the cost recovery debate on WATSAN in India.

Politically, water supply has remained a state responsibility since independence. Political promises on state supplied WATSAN centre on the following four conceptual points:

- The poor cannot afford safe water and sanitation and should not have to pay for it;
- Public subsidies are provided to help the poor pay for water and sanitation;
- The Government of India can solve the problem of water supply by running water and sanitation programmes itself; and
- The Government of India can raise the financial resources needed for water supply and sanitation.

The WSP, however in these publications, suggest that reality is more akin to the following:

- The poor in India actually do pay for water supply and sanitation, often far more than their fare share;
- The subsidies for water supply and sanitation benefit mainly those who are not poor;
- Public provision on water supply is inefficient and ineffective; and
- The investment requirements for water supply and sanitation in India are far too great for the Government of India to afford.

The WSP have also gathered together a large amount of evidence from a number of studies and practical experience across India, which indicates that many urban and rural communities are wiling to pay for water and sanitation services. Many people are often paying more, in fact, than the official tariff through informal channels and coping mechanisms and would be happy to pay for a better, more reliable service. However, the WSP suggests that there is sluggishness within policy makers to respond to this evidence. Political commitment to tariff reform is seen as critical.

Hence the situation in India is of great pertinence to this study, both in terms of the size of the problem in India itself, and because the key issues identified by the WSP in India reflect, support or complement the findings of the Kar study. Namely:

- It may be important to think less about absolute incomes (whether people can afford water supply and sanitation services or not) and more about designing convenient ways of helping people to pay for the water supply and sanitation services they want.

- The key issue that seems to makes cost recovery of WATSAN investments less straightforward was found to be *political interference.*

Thus, any examples of projects in India that have surmounted these obstacles would be of great interest, not only within an Indian context but also in terms of the wider replicability of their approach to resolving these generic problems.

1.1.2 *Policy Background to Rural Water Supply and Sanitation in India*

There is a long and complex policy history to rural water supply and sanitation in India, and an attempt has been made to summarise the key policy and institutional issues in the two boxes below. In short, there has been a (arguably unsuccessful) history of State level provision of services since independence, which is giving way now to a more decentralised and community-focused model of implementation. Cost recovery, partly of capital costs and mostly of O&M costs, now plays a significant part in this decentralisation process.

Box 1 *A Brief History of Water Supply In India, with respect to cost recovery*

Chronology

- A national water supply and sanitation programme was introduced in the social welfare sector in 1954. The basic premise continues to be that the provision of safe drinking water is the responsibility of the Government.
- Under this programme Funds are provided from the State budgets for drinking water supply as a part of every five-year plan.
- The Federal Government funded Accelerated Rural Water Supply Programme (ARWSP) was introduced in 1972-3 and again in 1977-8. Implementation continues. The aim of ARWSP is to supplement the efforts of State Governments in providing rural water supplies, through 100% aid grants from Central Government.
- A Mission approach to the water supply programme was created in 1986; this became the

Rajiv Ghandi National Drinking Water Mission (RGNDWM) in 1991.

- 73rd Constitutional Amendment Act of 1992 (effective April 1993) legally transforms Panchayat Rai institutions into institutions of self-government for rural areas. Out of the 29 duties the Panchayat became responsible for, no.9 relates to drinking water and no.13 relates to health and sanitation. Individual state legislation follows this up to greater or lesser degrees over subsequent years (eg Kerela Pahnchayat Rai Act, 1994). The way is paved, therefore, for Community owned and managed water supply and sanitation systems in theory.

Other issues

- ARWSP has a target norm of 40 litres pp pd
- Up to 15% of ARWSP funds released each year can be used for O&M costs, as can 15% of another Government grant programme - the Minimum Needs Programme.
- Sector Reforms are looking for increased community participation in rural water supply programmes. They suggest the failure of water service coverage and reliability is due to the perception of water as a social right to be provided free. Instead the reforms are looking for recovery of O&M and replacement costs from users.

20% of ARWSP annual outlay is now earmarked as an incentive for those State Governments that take a demand driven approach to WATSAN implementation; that build Village Water and sanitation Committees; and that attain 10% capital cost sharing and 100% O&M costs from their recipient villagers.

Box 2 ***Revised Guidelines for the Rural Water Supply Programme***

- Prepared with the support of the World Bank, these Guidelines help to revise the rural water supply programme and also suggest that:
- Panchayati Raj institutions should be encouraged to adopt the concept of community participation in the development of their rural water supply programmes.
- Institutionally there is a State Water and Sanitation Mission; a District Water and Sanitation Mission; a Gram Panchayat Water and Sanitation Committee and a Village Water and Sanitation Committee. The State Mission should provide policy guidance, auditing and evaluation; the District Mission should coordinate the receipt of central funds and the selection of water supply agencies to deliver services (private sector, NGOs); and the Gram Pnchayat and Village Committees should ensure community participation and manage user contributions to capital and O&M costs
- Levels of service should, if possible, be in accordance with user preferences and expressed demands
- For externally aided projects, the following elements should be adhered to:
    - Adoption of a demand driven approach
    - People's participation through a decision-making role in the choice of key design and management arrangements
    - 10% capital cost share and 100% share of O&M costs by users

Based upon this background of policy history and change and the thoughts of some key WATSAN actors, the KaR research aimed to investigate some specific projects, to see if generic lessons could be learned from them and the policy contexts in which they were operating.

1.2 CASE STUDY PROJECTS

1.2.1 *The World Bank Swajal Project, Utttar Pradesh, India.*

The Swajal Rural Water Supply and Sanitation Project is an oft-cited story of World Bank success with regards to rural water supply and sanitation in India. It is a US$63 million project covering about 1,200 villages in 19 districts in the Hill and Bundelkhand regions of Uttar Pradesh. It is a six-year project lasting from 1996 - 2002. Central to the project's design have been two major polices:

- Partial capital cost recovery (10%, with upfront cash contributions varying from 1% to 5%); 100% operation and maintenance cost recovery from user communities; and about 60% cost sharing for individual latrines.

- The creation of an alternative service delivery mechanism for rural water supply and sanitation, involving a partnership between the village water and sanitation committee, NGOs and a Project Management Unit (PMU). The PMU is an autonomous entity at state levels, which coordinates the allocation and spend of the project's finances, transferring funds to community managed bank accounts. The village procures goods and services with the assistance of the NGO who act as a support organisation. The Village Water and Sanitation Committee is legally empowered to manage these funds and to operate and maintain the systems built.

The Swajal project has undoubtedly been very influential in India's rural water supply sector. The cost recovery objectives it set are now part of key recommendations for India's national water supply policy (see above). The use of the community contracting system too, has been successful, with the supply chain for goods and services coming almost entirely from the local or regional private sector and with village councils having much more control over procurement, design and spend. Training villagers in contracting and project management has also been extremely useful.

However, there maybe doubts as to the ultimate replicability of the project, both financially (should every state in India receive US$63 million?) and institutionally (does every successful project of this nature need an independent PMU set up at state level? How will the PMU re-integrate with the existing state level water supply agencies at project close?). Furthermore, it is worth emphasising that the Swajal project is not cost recovering - replacement or expansion costs are not part of the user payments, neither are 90% of the original capital cost of the intervention. It will be interesting to return to project schemes in Swajal in ten years or so

to see how financially and institutionally sustainable the interventions, which the project supported, have been.

1.2.2 *Village Level Water Supply Schemes in Olevanna, Kerela.*

Olevanna is a Gram Panchayat (GP) with twenty wards located on the eastern side of Calicut, a city in Kerela State, southern India. Olevanna is one of six GP's in Kozhikode Community Development Block in North Kerela. The Olevanna GP covers 21.5 km^2, with a total population of about 50,000 people or 10,100 households (as of 1998).

The population of Olevanna has historically suffered acute scarcity and unreliability in their rural water supplies. There is plenty of water around, but it is saline and during the summer months there is often a shortage of potable water.

The scarcity problem was particularly acute in the drought of 1985. At that time there was just one state run Kerela Water Authority (KWA) scheme providing an erratic water supply to 1,600 households. Burdensome coping strategies to obtain water from other means were often employed (see box). The GP, therefore, came under extreme pressure from the population to resolve this problem. In 1987 the GP commissioned the first piped water scheme in Vettuvedankunnu Ward. This consisted of an intake well, an overhead tank and pipelines to distribute water through public stand-posts. It served 400 households and was funded by State Government grants to the Block Panchayat.

Getting water in Olevanna before the schemes

With few or erratic official schemes in the area, households would tend to collect water from streams or wells between 200-1000 meters away. This could take up to 5 hours a day and result in just 100 litres per household per day.

Despite the popularity of this scheme, however, the state budget constraints, which both the KWA and the GP faced to expanding these initiatives, were stringent and they were discussed in length with the population in the GP. Villagers realised that local solutions to funding would have to be found if more of these schemes were to be developed. One village member decided to collect money from his neighbours, with a view to installing a small 1 HP pump and an intake well to service five households in the hamlet of Kamniliparamba. This self-financed scheme worked well.

With the success of this scheme, and the continued support of the GP, 54 other households in Kamniliparamba Ward got together to meet their own

water supply needs. They formed a registered co-operative society to organise their finances and make their operations official. From this beginning a network of privately run water supply schemes in Olevanna grew. Between 1987 and 1995, 26 such privately registered schemes arose across the Olevanna GP. In general, each household per scheme put in between 4,500- 12,000 rupees for the capital costs of the scheme and then paid 5-10 rupees per month for O&M costs.

The GP played a facilitatory and regulatory role in this process, rather than acting as a supplier. At first it spent its efforts convincing other groups of households that these schemes could work (each new scheme was launched with support of the GP in a festival manner to create a sense of occasion and ownership). The GP also provided a review and audit procedure for each co-operative's accounts, and it developed some rules of supply – limiting supply to 400 litres a day and encouraging water meter installation to ensure these limits were adhered to, or that extra costs for the additional supply (20 rupees per 1,000 litres) were paid.

A key issue that the GP highlights has been the changing role of the KWA. From 1987 – 1995 the Olevanna schemes worked despite of, rather than because of, the KWA. The official state water supplier was not helpful in the early days, as the schemes offered a threat to the KWA's own duties and reason for being. However, since the decentralisation process for water supply and sanitation began in earnest in Kerela in 1995, the KWA have been much more supportive. Indeed, the KWA has now accepted the Olevanna model as a legitimate and successful approach, but only as a result of a statewide policy change.

Since 1995 a further 34 schemes have been created in Olevanna GP (which means a total of about 10,000 households now benefit from these private schemes), but with the decentralisation policy the approach has changed slightly. Now, the GP can provide 50% of the capital cost of the scheme and uses this if required to help with payments, for instance if the households cannot pay the full 100% of capital costs. User charges have increased to 30-40 rupees per month (maximum of 50 in one scheme), due to increased electricity costs for pumping. And many schemes are now operating at a surplus (see box).

Table.1 ***The monthly operating budget for October 2001 for one scheme in Olevanna***

This particular scheme was set up in 1997 and covers 643 households, with 25 more joining in October 2001; the budget forms part of the monthly report to the GP.

Income:

25 new connections - 91,520 rupees

Monthly tariff (25 rupees per household) 16,700

Previous balance - 1,693 rupees

Total income - 109, 913 rupees

Expenditure

To reconstruct a well - 40, 354

To replace a pipe - 8,805

To repair pipes - 8,458

Salary to the scheme operator/ caretaker - 9,900

Electricity charges - 11,993

Total expenditure - 79, 510

Operating Surplus for October - 30, 403 rupees

However, there are some potential problems. Despite operational surpluses, no money is formally set aside for depreciation or expansion costs, though the GP thinks this would be perfectly possible if training in financial planning and accountancy were provided to the users. Also, these surpluses tend to sit in co-operative society accounts and are not considered as useful sources of finance for other investments, scheme expansion or community loans within the GP. Finally, there are problems with groundwater depletion, and the GP is looking for help (and legitimacy) to introduce demand management instruments and other forms of rainwater harvesting techniques to the schemes.

Nevertheless the Olevanna schemes are extremely interesting in so far as they show that full cost recovery can be achieved in peri-urban areas (with reasonable levels of poverty) for water supply systems. People did pay the full cost, relying on little external help. Furthermore, these schemes have included effective metering and volumetric-based charges and, importantly, have involved an institution that used to be responsible for supplying water, re-emerging as an effective facilitator and regulator of the system. Importantly too, the official water supply agency was not a supporter of the system until a policy change toward decentralisation took place, which legitimised the existence of the schemes in the state water supply providers eyes.

1.2.3 *The Kerela Rural Water Supply and Environmental Sanitation Project – Implementation within the Kunnummel Panchayat*

The Overall Project

The KRWSSP is a US$80 million project, supported by an IBRD loan of US$60 million, with the balance financed by beneficiaries (US$8 million), the GP's (US$6.5 million) and the Government of Kerela (US$5.5 million).

The project will provide WSS in four districts in Kerela – Thrissur, Palakkad, Malappuram and Kozhikode. About 80 GPs from these districts, out of a potential 358 have been identified for project implementation via a number of criteria including levels of need and poverty, as well as a local capacity to implement. A limit of 30,000,000 rupees per GP is set. Within each GP, there will be about 25 beneficiary groups.

The flow of funds is as follows. The GOI provides the IBRD finance to the GOK in the form of additional central assistance. The GOK authorises the KWA to draw new funds for the project through a separate bank account. These funds are passed on to DPMUs operating at the districts. Funds from the DPMU, the GP and the beneficiaries then flow into the same bank account, to support each scheme within the district.

Overall the KRWSESP is expected to directly benefit about 1.5 million people or 5% of the state population. It is said that the project emerged after a World Bank team leader had visited the Olevanna Schemes.

Key benefits and costs of the project were identified in the World Bank's ex ante cost benefit analyses.

The benefits were estimated to be as follows.

- Timesavings in water collection, averaging 1.3 hours per day, especially for women. Time savings were valued using a wage rate of 57 rupees per day;
- Incremental water consumption of 6 litres pcpd valued at the average of current and future costs of water supply; and
- Savings from avoiding recurring costs required to maintain the present water supply arrangements (boiling, storage etc).
- A salvage value of 5% at the end of the 20-year life of the scheme.

The key costs of the project (in constant 2000 prices net of taxes) were identified as follows:

- A (weighted average) capital cost of water supply of 6930 rupees per household plus 1,500 rupees per domestic connection for 70% of the

households via co-financing and 4,000 rupees for 20% of the households to co-finance a latrine.

- Annual O&M costs per household (weighted average) of 180 rupees
- Watershed development costs, taken as 10% of the WSS costs (690 rupees per hh)
- Software costs estimated at 1070 rupees per household
- Institutional strengthening costs (including capacity building, project management etc) estimated as 2,080 rupees per household

Consequently, the ERR was estimated to be 25% for the whole project. This ERR, of course, understated the benefits relating to improved health, environment and community/ institutional strengthening activities. Sensitivity analyses suggested that the project could sustain a 12% ERR, despite substantial increases in costs and/ or decreases in benefits; and a 50% reduction in estimated time savings.

In cost recovery terms, the conception developed by the World Bank was that 15% of the capital cost of each scheme was to be paid by the beneficiaries (of which at least 7.5% of payment must be in cash). The beneficiaries should meet 100% of the schemes O&M costs - about 180 rupees a year on average.

Kunnummel Panchayat

In order to look at implementation of the KRWSESP at GP level, a visit was made to the Kunnummel Panchayat, with the head of the DPMU for the District.

Kunnummel Panchayat has 10 Wards and a total population of 17,365. This translates into 3,868 households, of which 35% are below the rural poverty line of 18,000 rupess per hh pa. In terms of water supply, there are currently 2,820 private wells, 20 public wells, 4 borewells in the GP, but just 868 official KWA standposts and 70 KWA private connections. The Panchayat has created another 6 WS schemes and 14 public stand posts. There are 42 ponds from which people also draw their water. However, 3679 households (95%) have sanitary latrines.

Kunnummel Panchayat is known for implementing the 73rd Amendment decentralisation principles well and as such is a GP where the KRWSESP should be working reasonably well

The project is covering 970 out of the 3868 households in the GP across 9 of the 10 wards. There are 27 beneficiary groups in total, with about 36 households per group. Each group has a proposal for household latrines, schemes under drainage, waste disposal and women's development initiatives including micro-enterprises.

For the WS component, the project will aim for 70 litres pp pd, 8 hours pumping pd, with a 4 hour am and a 4 hour pm slot to pump water.

For the environmental sanitation programme, low cost latrines are envisaged for those households below the poverty line only, and these households are expected to meet additional costs over and above the 2,000 rupees provided by the Project.

As per the project design the Kunnummel Panchayat will contribute 10% of the capital costs of the project, the beneficiary's will contribute 15% (7.5% in cash and up to 7.5% in kind) and the remainder will come via the GoK (5%) and the DPMU for the project (70%).

NASRAD, a local NGO is the support organisation for the project within this District and will help the DPMU to provide community facilitation and participation expertise.

Design and Implementation Strategy

Within Kunnummel Panchayat, the local design and implementation strategy has been as follows:

- A feasibility study undertakes a review of existing water sources, sanitation and environmental conditions in the GP. This follows various community meetings, which identify water scarcity problems.

- The WATSAN priorities within key wards in the GP are then short-listed.

- Via more formal group meetings in each of the short-listed Wards, the possibilities for project assistance are outlined and the potential roles of the different stakeholders are explained to the communities, including their role and responsibilities. If communities are interested in participating further, they are asked to form themselves into informal beneficiary committees and nominate representatives.

- These informal beneficiary committees then apply to the Panchayat for formal recognition of their group (this recognition states their location, the number of households in the group, and a statement of their willingness to participate in the project).

- Following this formal recognition, steps are taken for the formal election of an executive committee for the Group and for subsequent formalisation under relevant byelaws etc., of the application fees, monthly subscriptions and so on. Bank accounts for the Beneficiary

Group are established and the first 7.5% down payment are then collected from the Group members in three instalments.

- Following a more focused socio-economic baseline survey of the Group and identification and negotiation over uses of potential water sources for the Group's scheme, a technical team undertakes the formal design survey. Further negotiations have often been required between the Beneficiary Group and various landowners, whose wells or areas of land are required. The purchase of this land is organised, with the costs being added to the capital costs of the project.

- A community planning meeting then makes decisions over the construction based on all the data, and final estimates of cost and a community action plan for implementation are drawn up. At the planning meetings the technical options for the group are discussed (including price). These have generally taken the following shape:

    - Bore hole - 300,000 rupees
    - Open well - 350-400000 rupees
    - House connection - 3000 rupees (a pipe running from the main pipe for a maximum of 10m towards the beneficiaries' house).
    - Public Tap - 1500 rupees

  (So far, 26 out of 27 Beneficiary Groups have selected the open well and house connection option).

- Following this process there is a detailed engineering study and a finalisation of costs - both capital (including purchase of land for the well, which can range from 5,000 to 25,000 rupees for up to 40m^2) and recurrent, including replacement, costs (recurrent costs usually come in around 45 rupees per hh pm)

- The 7.5% cash contribution from the Beneficiary Group is then asked for (labour rates are calculated on local digging costs). The DPMU provide 40% of their contribution.

- Following audits and costs revisions during the construction process, the subsequent disbursement amounts required from the DPMU, the GP and the community are adjusted and then made (to avoid delay the Project provides the GP's 10% contribution, and then looks for the GP's contribution to be met in other ways). Throughout implementation there are QC checks, monitoring and evaluation on the scheme finances and works.

- Operation and maintenance costs are collected from the Beneficiary Group, averaging up to 1.5 rupees per hh pd

Observations

Thus far into the project, and at a DPMU level, there are a number of observations about the KRWSESP:

- The DPMU thinks beneficiary groups can pay a lot more towards the capital cost of the schemes than the 15% they are currently asked for;
- The design of the networks maybe a little top heavy - people may want more than 10m of pipe towards their house or more than 70 litres pp pd for more than 4 hours a day and be willing to pay for it, but they can't.
- The project has a top heavy institutional network of PMU and DPMU's, rather than locally organised institutions disbursing funds
- The DPMU's are still deliverers rather than facilitators/regulators of water supply and sanitation services. The facilitation role is falling mainly to the local support organisation, NASRAD.
- NASRAD, is used to provide the (neutral) community participation and negotiation skills the KWSA and the GP doesn't have.
- The project is expensive - US$ 72 million - and not necessarily replicable without another loan to the PMU, given the low level of beneficiary contribution required. The payback of the loan for the project by the GOK is another issue that may question the reliability of the project. Comparing the cost: benefit ratio of Olevanna and KRWSESP for its recipients (and for the state government) would be interesting.

1.2.4 *The DFID Supported Andhra Pradesh Urban Services for the Poor Project (APUSP)*

The Municipal Administration & Urban Development, Government of Andhra Pradesh, is working in partnership with the Department for International Development (DFID) of the Government of the UK to assist poor communities in 32 towns of Andhra Pradesh called the Andhra Pradesh Urban Services for the Poor (APUSP). It will last from 2000 to 2007. The towns the project focuses on are between 100,000 and 1 million in population and hence have a reasonably degree of peri-urban, or slum, related issues to tackle, especially in relation to water and sanitation services.

Project assistance by the UK government is £94.4 million. The entire assistance is a grant to Government of AP. About 71% of the assistance from DFID will be in form of financial aid for services, and 29% is Technical Assistance such as training for councillors, officials, civil society

organisations and communities to improve the performance of the Municipalities to deliver and maintain the services, which poor people need. APUSP comprises three linked and complementary components.

- Component 1 (£15.7 million) focuses on municipal reform. This means strengthening of municipal finances, improved financial planning and municipal accounting, staff training, improved operation and maintenance (O&M) practices, as well as more effective planning. Municipalities will prepare Municipal Action Plans for Poverty Reduction (MAPP's).

- Component 2 (£12.6 million or Rs.525) provides improved environmental services including water supply, sanitation, solid waste management, drainage, roads/footpaths and street lighting for slums.

- Component 3 (£12.6 million) works with community-based organisations in order to improve understanding of the needs of the poor, municipal decision-making and advocacy for improved services. It will also provide grants for small community projects through a new Urban Initiatives Fund

To administer the project, two new units have been established in the State Government Department of Municipal Administration & Urban Development (MAUD) - the Municipal Strengthening Unit (MSU) and the Appraisal and Monitoring Unit (AMU). MSU supports municipalities and provides assistance in and arranges their access to funds. AMU appraises the MAPPs and monitors their implementation. The AP Urban Finance and Infrastructure Development Corporation (APUFIDC) will channel project funding to the municipalities

The two units and the international consultancy team, which provides Technical Assistance to these units and the project in general, are working very closely with state policy makers on urban infrastructure for those towns. As a result, they experiences at first hand the difficulties decision makers have in decentralising revenues or to raise tariffs for municipal services such as water supplies and sanitation, particularly when state funds are scarce.

An Improved Water Supply Report for the project indicated that:

- Water supply is a key sector in AP.
- The objective should be on short-term physical improvement to the networks.
- Limited improvements are possible, but the focus should initially be on non-technical aspects (for example the fact that 60-70 % of water is delivered free).

- Other issues to focus on should include improved management, increasing revenue and reducing losses, training and public awareness, and more community and private sector involvement.

An improved Operation and Maintenance report for the project (not just for WATSAN) showed that:

- Overall, delivery on O&M is a major deficiency.
- The underlying reasons included a lack of political awareness, insufficient funds, ineffective management, poor planning, decision-making and use of limited resources, and a skills deficit.
- There is a growing awareness at both State and local levels that changes in O&M approaches are necessary.
- The way forward is seen as improved private and community sector participation and capacity building.

In relation to WATSAN, the project's main focus for cost recovery is on collecting people's dues on water supply tariffs, rather than on working to design and set a correct level of the tariff. This is because

- There is a feeling that people can only pay up to 3% of their income on a water/ wastewater tariffs.
- It is felt that bigger gains can be made on reducing the supply costs of water/ wastewater services (especially in relation to energy) than on increasing revenue.

In short the project feels it will be difficult to charge people much more than currently for these services, but it is possible to collect much more of what is owed and supply the services more cheaply, hence improving the financial sustainability of the schemes it helps to implement.

Using the MAPP approach for designing its municipal projects, APUSP can provide seed corn money for connection charges to water in main urban areas, for instance, and seed corn money for network development in the slum areas.

The project adopts a process-based approach and so did not have any fixed ideas about reasonable levels of cost recovery to aim for at the outset. Instead, the aim has been to make the Municipalities more aware of the recurrent costs of their WATSAN services, what is being built new, and how best to both reduce the O&M costs and sustainably fund them. With regards to O&M charges, the project follows state tariffs for water supply, which were only 30-40 rupees per month, but have been increased to 60. The project would like to see them increased to 70. At present, slum dwellers are obliged to pay only 50% of the tariff.

Observations

Thus far into the project, there are a number of observations about the APUSP:

- This project again relies on a PMU approach at state level to oversee a large budgetary transfer - in this case close to US$134 million. With state governments in fiscal crisis, it can be difficult for the project team to argue for long term changes in policies to promote further cost recovery when they are holding the purse strings to such a large amount of funds and potential subsidy.
- The project is expensive - US$ 134 million - and not necessarily replicable without another loan to the PMU for other cities in the state, or other Class 1 cities in other states, given the low level of beneficiary contributions required.
- Assumptions are being made about the levels of affordability of the poor and hence cost recovery. Most project focus is on reducing supply costs, collecting dues and setting limits to options based on a judgement of what is affordable, rather than looking to find (financial and institutional) ways of helping people to pay more for what they really want.
- Useful recommendations are being developed about the need for private and community sector participation in service delivery.

1.2.5 *The Urban Slums Health and Sanitation Improvement Programme, Tiruchirappalli, Tamil Nadu, India.*

"Pay and use" community latrines in the slums.

This project involved the Tiruchirappalli Corporation, the Tiruchirappalli District Administration, Water Aid India and three local NGOs ,GRAMALAYA, SCOPE and SEVAI as implementing agencies.

Tiruchirappalli City is in the heart of Tamil Nadu, southern India and has a population of 668,000.The city has 155 slum areas containing about 115,000 people. Gramalya NGO, which was the target of the KaR visit with Water Aid, works in 8 slums in the East of the city. Under the Programme, it was proposed to construct, inter alia, pour flush water seal community latrines by demolishing the existing, state supplied, dry earth community latrines, in each of the 8 slums. For maintenance of these new assets, women members of self help groups from the respective slums set up SHE teams (Sanitation and Hygiene Education teams).

The Municipal Water Corporation had originally built community latrines in the slums in the mid 1980's, but these latrines fell into in a state of decay

and had been totally abandoned by local residents. Drainage pipes were broken and the sceptic tanks were damaged. This had meant that people were defecating in, around and nearby to the latrines and their environs, rather than using them as they had been meant. Defecation on the banks of the local river also took place.

The key problem was a lack of a sense of ownership over the latrine blocks. The blocks had been built by the state, but were not properly maintained, cleaned or repaired. Local people felt no sense of ownership and the infrastructure fell into decay. There was little interest in the construction of new community latrine blocks as people felt the same thing would happen again in time.

Gramalaya sat with local Women's Self Help Groups from within these slum areas and discussed possibilities. Could a new sanitation block be constructed? Was there a need for one? If so how could it best be run in the long term? There was a clear local need for improved sanitation and washing facilities in each neighbourhood and there was plenty of thought as to how such a facility could be managed.

One group came up with the idea of paying to use the toilet - 25 paisa a time to keep it clean. Once the purchase of cleaning materials and the wages for cleaners, and a watchman cum ticket issuer were incorporated, this was raised to 50 paisa a time.

Water Aid provided Gramalya with a grant of 380,000 rupees to build the latrine block, usually consisting of spaces for 10 ladies; 10 men and a child friendly toilet block for those less than 6 years old. The blocks were connected to soak pits which need to be emptied on a regular basis (if no soak pits were present Water Aid provided a grant for a further 160,000 rupees to construct them). With local inputs for labour coordinated by the SHE teams, the site was decorated and finished in an attractive fashion. The charging system was then introduced in one scheme, the first of its kind. Some in the community were against the idea at first.

The SHE team looks after the upkeep and maintenance of the community toilet block constructed in their slum. Every user is issued a 50 paise token allowing him/ her to use the toilet. A woman from the self-help group collects the money from the paid ticket issuer and closes the account every 12 hours. The accounts (a ledger) contain details on the number of users and money collected. During nights a watchman cum ticket issuer is appointed.

An average of 300-600 people use each community toilet every 24 hours, totalling 150-300 rupees a day. People prefer to pay their 50 paise and use the pay and use toilet blocks because they are reliably secure and clean,

compared to other Municipal Corporation blocks or other options available for defecation.

The first pay and use latrine, collected 168,500 rupees gross over the past 16 months. Table 1 charts the performance of the five schemes as of 30.09.01

Table.2 ***Income and expenditure relating to pay and use community toilets***

Name of Slum	Total number of seats	Total number of users	Total Income (Rs)	Total Expenditure (Rs)	Expenses on other community development Activities	
	Men	Women				
Karuvattupettai	10	10	307,762	153,881	33,050	120,831
Viragupettai	20*	10	229,700	114,850	19,750	95,100
Kamala Nehru Nagar	10		55,620	27,810	15,900	11,910
Kalmandhai	18*	10	318,900	159,450	49,650	109,800
Kalpalayam	11*	27	17,000	8,500	1,900	6,600
TOTAL	69	57	928,982	464,491	120,250	344,241

**denotes toilets renovated out of profit from the pay and use system*

Table.3 ***Income and expenditures for one particular pay and use system up to end September 2001***

Income and expenditures for one particular pay and use system up to end September 2001.

1. Income - averaged 9,965 per month over past 16 months: 159,450 rupees

2. Toilet related expenditure to date: 62,200 rupees

Cleaners - 11,200 (700 rupees per month)
Cleaning materials - 12,000 (750 rupees per month)
Token issuer/ caretakers - 33,000 (2,060 rupees per month)
Token shed - 6,000 (lump sum)

3. Expenditure from savings to date: 51,470 rupees

Community hall - gained a loan of 10,470 rupees to pay for 50% of costs, based upon the income from the toilets. Paid for other 50% of costs out of toilet income.
Drainage channels - 10,000
Extension of corporation pipeline and water tank - 3,000
Garbage collection - 1500
Well digging and motor pump - 27,000
Loan of 5,000 rupees to neighbouring slum group at 12% interest p.a - received back 5,500 rupees

4. Surplus in bank after 16 months: 45,700 rupees

The money collected is deposited in a Bank Account under the SHE team's name each week. At the end of every month the SHE-team and the particular Women's self help group from that slum convene a meeting and detail to members the income and expenditure for a particular community toilet. The balance, after meeting various expenses such as salaries and

purchases of cleaning materials is kept in the bank account. The amount saved each month is pooled as a common fund for that particular slum towards health and sanitation related promotional activities including extension of street taps, construction for community halls, renovation of other damaged community toilets, construction of domestic drains, rubbish bins and provision of street lights.

Future investments from the toilets include plans for bathroom facilities, a urinal complex, a sewing machine centre and other investments depending on needs. As the knowledge of these latrines has spread, loans have been made from the surplus and advice given to other slum communities to help construct their own pay as you go latrines.

A visitor's book for the toilet blocks has recorded the impressions of state level decision makers and WATSAN decision-makers from elsewhere, such as Chennai. However, without an official policy change at State level, the local Municipal Corporation tasked with providing WATSAN services in the slums won't approve or promote the pay as you use system.

Observations

- The pay and use latrines are being utilised by very poor slum dwellers
- The first schemes relied on 100% subsidy for the capital cost.
- The schemes are more than 100% cost recovering recurrent costs.
- The capital cost could be paid back over a number of years. However, the surpluses these schemes have built up as a result, are instead being used to help wider WATSAN developments in the neighbourhood, or as loans to part-pay for other slum self help groups to renovate their systems. As the schemes are starting to self-replicate, less and less grant funding will be required over time. Is this a more efficient way of paying back capital costs, in terms of the outputs it creates?
- No PMU is involved – a local NGO is the implementing agency. An INGO coordinates the QC of the NGOs delivery.
- With more financial training and co-financing from other sources, the impact of these schemes is growing.
- The "seeing is believing" impact of these schemes is strong, both within and beyond the slum communities. However, policy changes are required to allow the State supplier of WATSAN to also "buy into" this approach to service delivery.

1.2.6 *Scope/ Water Aid Rural Water and Sanitation Programme, Tamil Nadu*

SCOPE – A rural NGO partner for Water Aid

Scope is an NGO based in Tamil Nadu, formed in 1986. It operates in just one rural block in Tamil Nadu and in some of the urban areas of Tiruchirappalli. In the rural areas, SCOPE works independently, but with the support of the local block development office.

SCOPE focuses on the conservation and best use of water supplies and was an early local partner of Water Aid India. SCOPE is currently the Water Net Convenor for some 36 NGOS working on WATSAN issues across Tamil Nadu. However, since its formation, SCOPE has also branched out into rural production centres and savings schemes, supporting micro enterprises and businesses for rural people.

SCOPE has received funding and support from organisations such as the Netherlands Embassy through their Sanitation Partnership, Lutheran World Relief (Canada); Christian Aid, UNICEF, Solidarite Francais and a range of other international agencies and NGOs. However, SCOPE gets 60% of its funds from local government in Tamil Nadu (the social welfare board, the small wasteland development board and the forestry board). In 1987 SCOPE had a 30,000-rupee budget; it had in excess of 10 million rupees for FY 00/01, all of which was targeted on promoting self-sustaining, not for profit activities for local beneficiaries.

Water Aid has given SCOPE 600,000 rupees per year for the past 5 or 6 years to assist with their rural programme. As a result, Water Aid can monitor SCOPE's activities. In terms of the WATSAN issue in rural areas, SCOPE recognises that NGO's are a "drop in the ocean", but seeks to obtain replication and uptake of its successes on an equal partner basis with the Tamil Nadu Water Authority.

A key achievement of the SCOPE- Water Aid partnership has been to encourage the first village in Tamil Nadu (and possibly the country) to develop 100% sanitation coverage for themselves.

Kar Hikulam Village, Tamil Nadu – A Successful Rural Sanitation Scheme

Kar Hikulam village in Tamil Nadu is a typical southern Indian village in a very rural area. It has 110 households, or about 612 people, 90% of who are below the rural poverty line of 18,000 rupees per household per year.

SCOPE and Water Aid started work in Kar Hikulam in 1996. Their first participatory surveys of the village found that diarrhoea was a key issue, especially among women and the young. People were spending up to 2000 rupees a year on travel and medicine costs on the condition (the nearest town with a clinic is about 40 kilometres away). There was also just one pump and bore-well, and one water tank built by the state rural water supplier in the village. Water supplies were intermittent, available

in the morning and evenings only. To obtain reliable water supplies, women were rising early in the morning (3am or so, in order to avoid queues) and spending up to 2 hours a day travelling over a kilometre to draw water from a 70 foot well by rope. Only about 15 litres of water were obtained each trip.

SCOPE responded to the key demand of the community in Kar Hikulam for water supply first, and drilled three new tube-wells in 1996, 1997 and 1999, installing one hand-pump on each. These cost 24,000, 27,000 and 30,000 rupees respectively, and the community were asked for a cash contribution of 10% in each case.

For operating and maintaining the 3 tube-wells, each household was asked to pay 2 rupees per month. Hence 220 rupees per month were collected (2,640 per year). A surplus was built up (O&M costs were low - 60 rupees a year - and replacement/ extension costs - a new set of piping - cost 3,900 rupees and have only occurred once).

At the same time as the first tube well, SCOPE also set up self-help and savings groups for women - 4 women's groups of 20 members. 25,000 rupees were put into each group by SCOPE to kick them off. Each member paid 25 rupees a month as savings into the group and 2 rupees subscriptions. Then, on a revolving basis, women could draw loans from the fund at a 2% interest rate per month (24% per year). Prior to this, moneylenders were asking for 10% interest per month. From 1996 - 2001, the women's savings groups have increased in the village to each hold about 70,000 rupees.

Two men's savings groups of 14 and 28 members were started in 1997 and these now have about 98,000 rupees in them.

With regards to latrines, however, the community remained unconvinced at the project start. SCOPE asked the village leaders to put forward ten households to be involved in the construction of ten "model" toilets. The setting up of the savings groups and the drilling of the tube-well was conditional on this issue. No toilet volunteers, no other assistance. Ten volunteers were found.

Each volunteer was given a subsidy of 650 rupees per toilet to help build the latrine pit safely up to a plinth level (the total cost being up to 1500 rupees to build the whole toilet structure). There was also technical guidance to help build the superstructure, and the possibility of a 650 rupees loan from SCOPE to help build the structure if needed.

The toilets were constructed with a bathroom and attached to a kitchen garden in order to use the wastewater. Out of a range of standard designs, different people chose different toilets.

Once the first 10 were built, they became very popular, especially among the women (due to their convenience) and more households requested a latrine. By the end of 1996, SCOPE had helped to build 68 toilets for 96 families. By the end of 1997, every household had built a toilet.

SCOPE continued to offer loans of up to 650 rupees to those who could not afford to meet all of their construction contribution. With a 650 loan and a 650 subsidy, only 2000 rupees maximum would be required to build the latrine. 39 out of the 110 households took on these loans. The self-help groups also offered further financial assistance.

The income from the kitchen gardens helped to pay back the loan for the toilets, producing on average 30 -90 kgs of fruit and vegetables a year, net of personal consumption, which was sold in local markets for up to 400 rupees in total.

By 1997, 75-80% of the women in the village were using the toilets, and by 1998, 85% of women were and up to 72% of the men were. By 1999 almost everyone was using a toilet.

In 1999 a follow up participatory survey found that no single case of diarrhoea had lasted longer than 2 days, and very few people were spending any time or money in the clinics. As a result the saved money was being spent on replacing roof tiles and buying more animals among other things.

By the end of 2001, sanitation uptake was occurring in up to 40 neighbouring villages, with people willing to pay, or take loans, for the full costs of the latrine. Households had seen the economic benefits the latrines were bringing to owners in Kar Hikulam, and were learning more from the discussions with SCOPE about these benefits. However, SCOPE continues to provide a subsidy on any new latrines, especially for the poorest, as they see the re-investment of any cost savings the latrine generates for the household as a better form of cost recovery. Self help groups also provide a range of financial assistance.

Importantly, SCOPE has also run sessions in hygiene awareness and education in parallel to the latrine building process. They have also installed a latrine mini-mart in a central location, selling all of the spare parts, building materials, soaps and disinfectants that latrine owners need, as well as being a source of advice to new latrine owners. The compound also displays the range of latrine models a household can choose from.

Both the goods the shops sells and its staff have provided jobs for local rural people. Furthermore, each village is encouraged to take on and pay for a water and sanitation caretaker, from a scheduled (lower) caste. Although the wage is not significant, the strong role in the community, which this provides for these people, is often of great personal importance.

As households in these rural areas now complain much less about their water supply and sanitation services, the Tamil Nadu Water Authority is quite happy with SCOPE' s work. SCOPE and Water Aid, however, are keen to continue with the capacity building of the Authority so that in time these kinds of approaches become part and parcel of what the TNWA does.

Observations

- The latrines have been taken up by very poor rural households
- The programme offers a 40% subsidy for the capital cost, and a further 40% loan for the poorest.
- The latrines have been marketed and designed to generate tangible economic and financial benefits (lower healthcare costs, kitchen gardens)
- The water supply scheme offered a 90% capital cost subsidy, but was priced to create a surplus from its operating charges to more than cover replacement and expansion costs
- Community financing clubs were created in parallel
- The first community has to be convinced, via a degree of conditionality, to invest in sanitation
- A wider infrastructure of advice, education and materials has been created to support the uptake of latrines
- Uptake of the latrines is taking place organically - 100% cost recovery could be obtained, especially via community financing options
- No PMU is involved - a local NGO is the implementing agency. An INGO coordinates the QC of the NGOs delivery.
- The "seeing is believing" impact of these schemes is strong, both within and beyond the rural communities. However, policy changes are required to allow the State supplier of WATSAN to also "buy into" this approach to service delivery and to allow the NGO to capacity build the state supplier to take on this kind of role.

1.3 *STAKEHOLDERS MET*

A wide range of stakeholders was met, from both a policy and project perspective. These included the following:

1.3.1 *World Bank Water and Sanitation Programme, South Asia*

- Salman Zaheer, Lead Utilities Specialist; szaheer@worldbank.org
- Vivek Srivastava, Country Team Leader (India); vsrivastava@worldbank.org
- Satyajit Singh, Rural Specialist; ssingh5@worldbank.org
- Michael Webster,Rural Development Specialist; mwebster@worldbank.org
- Junaid Amad, South Asia Programme Team Leader; jamad@worldbank.org

1.3.2 *DFID India*

- Yusaf Samiullah, Senior Engineering and Environmental Adviser; Y-Samiullah@dfid.gov.uk
- P. Srinivasa Rao, Engineering Adviser; S-Rao@dfid.gov.uk
- Debashish Bhattarcharjee, Engineering Adviser; d-bhattarcharjee@dfid.gov.uk
- Gopi Menon, Deputy Programme Manager (APUSP); G-Menon@dfid.gov.uk
- Vijay Pillai, Economic Adviser; V-Pillai@dfid.gov.uk
- Radhika Sridhar, Programme Officer, AP Office Hyderabad; dfidi-hyd@dfid.gov.uk
- RS Sharat, DFID Representative, Andhra Pradesh; dfid-hyd@dfid.gov.uk

1.3.3 *DFID Andhra Pradesh Urban Services for the Poor (APUSP) Project Team*

- Michael Whitbread, Municipal Governance Co-ordinator; m.whitbread@apusp.com
- John Crippen, Engineering Adviser; j.crippen@apusp.com
- G Subrahmanyam, Municipal Engineering Specialist; g.subramanayam@apusp.com

1.3.4 *The Olevanna Project, Calicut, Kerela*

The current and previous Grama Panchyath project team (including the ex and current Presidents of the Grama Panchayath, and Ward representatives) and some recipient villagers.

1.3.5 *World Bank Kerela Rural Water Supply and Sanitation Project*

- C Rajan, Project Manager, DPMU, Calicut dpmu_clt@satyam.net.in
- George Mathew, NGO local representative (NASRAD)

1.3.6 *Water Aid, Tamil Nadu*

- Shunmuga Paramisivan, Country Representative, Water Aid India; waindia@satyam.net.in
- S Damodaran, Executive Director, Gramalaya (NGO Implementing Agency for Water Aid), Truchirapalli Urban Slums Health and Sanitation Improvement Programme
- Scope (NGO Implementing Agency for Water Aid) Kattukulum Rural Water Supply and Sanitation Project

1.3.7 *General*

- Dr Ratna Reddy, Hyderabad University- An academic who has undertaken willingness to pay studies in water supply in India; ctvrr@sify.com
- Dr A J James, Independent Environmental Economics Consultant; ajjames@vsnl.net
- N K Narasimha Rao, Commissioner, Andhra Pradesh Academy of Rural Development; nkr@rediffmail.com

1.4 *SUMMARY*

The following table summarises some of the key cost recovery information from the range of WATSAN projects we visited in India.

Table.4 Summary of Cost Recovery

Project	Beneficiary	Capital Cost	Amount & % Recovery O & M Cost	Replace Cost	Water Supply	Toilets Constructed	Size of Scheme	% Below BPL	Cost of getting water/ toilets before	Remarks
Olavanna. 1987-88 to 1997. Peri Urban.	Gram Panchayat 50,000 population ~ 10,000 HH Coverage 80%	100% 4500/- to 12000/- per HH	100% Rs.5/- to 10/- per month per HH	0%	400 lt per day per HH + More at a price	No	26 nos	24% (Rs. 22,000/- p.a. for Peri Urban areas)	3 to 5 hrs 200 spent to fetch 100 lpd water from more than 300 m distance. Cases of diahorreah prevalent.	No scope for PSP. Great Leadership. Crisis created start. Demonstration effect.
Olavanna. After 1997. Peri Urban.	Gram Panchayat 50,000 population ~ 10,000 HH Coverage 80%	50% by beneficiary	100% Rs. 30/- to 50/- p.m. per HH	0%	400 lt per day per HH + More at a price	No	60 Nos (Incl.26)	24% (Rs. 22,000/- p.a. for Peri Urban areas)	People selling gold for capital cost. No technical support from KWA. Difficult relationship between 1987-1997 with KWA. Convincing was difficult and required repeated meetings. Decisions taken by Executive Committee. High Literacy existed.	Meters installed. Penalties for overuse. Subsidies for functions such as marriage, etc. WRM is becoming an issue now. Festive mood and media for inauguration. Chlorination done.
KRWSA. (Kunnumel) GP - Water Supply. Rural.	3868 HH (Total) 970 HH (Beneficiary)	7.5% in cash and 7.50% in cash / kind. 10% by GP. 75% by KRWSA DPMU (Finance by WB project fund of $80 million)	100%. Rs.1.00 to 1.50 per day per HH	Included in the O&M cost	70 lpcd	Yes. 3679 (Already existing)	27 Beneficiary Groups. 970 HH covered (25% fo total). 579/970 are BPL	35% (Total) (Rs. 18,000/- p.a. for Rural areas)	KWA scheme cost Rs. 22/ -p.m. per HH. It involved 3 to 4 hrs of walking to get < 70 lpcd.	Support Organisation is NASRAD. Pumping hrs = 4+4 hrs. Only 10 m pipeline is supplied under the scheme to each HH. Willingness to pay is Rs 1.50 p.m. per HH. Project conceived by W Bank after visiting Olavanna. Aim to build capacity of GP.

Project	Beneficiary	Capital Cost	Amount & % Recovery O & M Cost	Replace Cost	Water Supply	Toilets Constructed	Size of Scheme	% Below BPL	Cost of getting water/ toilets before	Remarks
KRWSA. School sanitation program	School children	30% to be contributed by the school from their budget.	100%	100%	N/A				Poor sanitation facility before. Unhygienic condition. Health Impacts.	40 Self Help Groups created to help poor in financing capital costs. Costs: Rs 30,000 for bore wells; 35000/- to 40,000/- for open wells; 3,000/- for HH connections; and 1,500/- for public taps. 5% of the total project cost can be used for land purchase. Land cost varies between Rs. 10,000/- (hilly) to Rs. 25,000/- (good area) per cent (=40 sqm).
KRWSA. Other sanitation program.	Objective is to convert deep pit latrines to 2 pit latrines for arresting GW contamination.	Beneficiary Contribution is Rs 3,470/- for new toilets. KRWSA Contribution is Rs 2,000/- for new toilets. KRWSA Contribution used to be Rs 500/- for toilets earlier.	100%	100%	N/A				Poor sanitation facility before. Unhygienic condition. Health Impacts.	DPMU says community can pay more. Under People's Planning Program (Decentralization) Community contribution is > 90%. Under Rajiv Gandhi National Drinking Water Mission comm. Contribution is >10%. No. regard to WRM. NGO's wants govt. to do WRM. High Literacy.
Women's Dev. Initiative (Microenterprises).	Women	Funding under WDI : 30% from beneficiaries per BG and 70% from KRWSA.								WDI (Microenterprises) gets Rs. 1500000/- out of allocated Rs. 30000000/- per Panchayat. Rs 1.0 million out of the Rs 1.5 million goes for starting the microenterprise. The balance Rs 0.5 million goes in training

Project	Beneficiary	Capital Cost	Amount & % Recovery O & M Cost	Replace Cost	Water Supply	Toilets Constructed	Size of Scheme	% Below BPL	Cost of getting water/ toilets before	Remarks
APUSP (Urban)	32 Class I towns (100,000 to 1.0 million population)	0% for infrastructure provision except Rs 6,000/- as connection charges.	Cost recovered through tariff, tax, cess, etc. Rs 60/- per month per HH.	0%						Political reluctance for increased tariff. Government order stating slums should pay less than 50% of others. Process of community negotiators called MAPP on how to spend the grant money. Funds required for seed money as APUSP would reimburse the expenses incurred. Current tariff can meet only 40% to 50% of the O&M costs. CR by reducing O&M cost and increasing collection revenues. Rule of thumb being used for setting tariff (2% to 3%).
Water Aid Slums (Urban)	25 Slums in Tiruchirapalli (Urban) - 9 in north zone; 8 in east zone; and 8 in west zone.	0%. Rs 380,000/= borne by WaterAid + Labour provided by community + Rs 160,000/- borne by WaterAid where disposal system was not existing.	100%. (i) Use & Pay @ Rs 0.50 per use; (ii) Rs 50/- per HH p.m.; (iii) Interests from funds of SHG used for other projects @ high rate of interest PLUS Rs. 500 per quarter per community for cleaning of soakpits.	100%	No	Yes			Poor Sanitation facilities	Rs 4,000/- surplus p.m. for Pay + Go, used for wider development activities. Federation of Committees (FoC) at Panchayat level. Sanitation fund of Rs 100/- per HH. Rs 0.5 million to Rs 1.0 million collected by FoC per Panchayat. Sum total of all Panchayat is more than 0.5 million, which is being used for development works.

Project	Beneficiary	Capital Cost	Amount & % Recovery O & M Cost	Replace Cost	Water Supply	Toilets Constructed	Size of Scheme	% Below BPL	Cost of getting water/ toilets before	Remarks
Scope + WaterAid Kattukulum (Water Supply). Rural.	110 HH. 612 people	Capital Cost of three borewells Rs 24,000/-, Rs 27,000/- and Rs.30,000/- respectively. Rs 2000/- contributed by beneficiaries for each borewell. Rest by Scope.	100%. Rs 2/- per month per HH covers all 3 Hand Pumps + caretaker + replacement of pipes.	Included in O&M costs.	150 lpd	N.A	100%	90% below R.P.L.	Before Water Supply was approximately 60 lpd. Collection time per day was over 2 hours. Distance of water source was more than 1 km and ropes, etc. was required for fetching 80 feet deep water. Women had to start at 03.00 am to 05.00 am for water.	Already each HH pays Rs 2/- p.m. (approx) for water tax, which is a past of house tax, for the unreliable government supply. Capital cost recovery is possible but NGOs believe in better utilisation is other development works. TWAD Board is very happy and so are the pump mechanics who have been trained.
Scope + WaterAid Kattukulum (Sanitation).	110 HH. 612 people	Total Cost Rs 1,500/-. Rs 650/- borne by Scope. Rs 850/- by beneficiary. Interest free Loans of 650/- by Scope to be paid back in 10 equal Installments. 39 HH availed loans from Scope. Other HH availed loans from SHGs. New toilets coming up on their own now.	100% by beneficiary	100% by beneficiary		100% coverage	67 HH by 1996. 110 HH by 2001. With attached bathroom.	90% below rural BPL	PRA done in 1996 indicated Rs 1,500/- to Rs 2,000/- p.a. per HH was being spent on medication. This fact was ased as lever.	7 SHGs formed. Savings of Women SHG is Rs 71,000/-. Saving of Men SHG is Rs 98,000/-. Commitment shown by Scope by providing 1st borewell and handpump. Hygiene awareness programmes. Kitchen gardens - sold net of consumptin Rs 400/- pm for 3 months. High costs, inconvenience, time, illness now reversed. Sanitary Mart, etc. provided. No serious case of diahorreah. Men had a longer take up. WaterAid in general in rural area. GoI provides capital Cost for borewell. WaterAid encourages community through training to meet O&M costs.
Scope + WaterAid Kattukulum (Self Help Group - SHG).	7 SHGs formed that are listed hereunder:									

Project	Beneficiary	Capital Cost	Amount & % Recovery O & M Cost	Replace Cost	Water Supply	Toilets Constructed	Size of Scheme	% Below BPL	Cost of getting water/ toilets before	Remarks
	1. Women SHG - 4 Nos X 20 members - 1996.	Rs. 2/= Subscription per month	Rs. 25/- saving p.m. Total Rs 71,000/- savings as on date.							Disburses loans @ 2% p.m. as against 10% p.m. charged by local money lenders.
	2. Men SHG - 2 nos (28+14 members) - 1997.		Rs. 15/- saving p.m. Total Rs 98,000/- savings as on date.							
	3. Elders SHG									
	4. Youth SHG									
	5. Mother SHG									
	6. Children SHG									
	7 Hand Pump Maintenance SHG									

Annex F

Cost Recovery in Water and Sanitation Projects – Lessons from South Africa

F1 COST RECOVERY IN WATER AND SANITATION PROJECTS - LESSONS FROM SOUTH AFRICA

1.1 INTRODUCTION: A CONSIDERABLE CHALLENGE

At the end of Apartheid, South Africa woke up with the considerable challenge of providing adequate water supply to 12 million people and adequate sanitation to 21 million people, as stated in the White Paper on Water and Sanitation. The end of Apartheid meant that space (and the division of that space) had to be completely revisited, and water services were seen as a key element of the institutional restructuring that has followed.

The first post-Apartheid government made provision of basic services to disadvantaged people one of its top priorities, particularly in rural areas and former townships. Since then, water has been a hotly debated issue in South Africa and many NGOs and public sector organisations have been advocating a "free water" policy since the end of the Apartheid. The ANC made "free basic water" its official policy line in the 2000 local elections. The policy sits uncomfortably with the simultaneous drive for decentralisation and market liberalisation in service provision. Both of these objectives are in turn consistent with reversing a non-payment culture and improving rates of cost recovery. While the importance of the cost recovery message is not completely lost on DWAF, or many consumers themselves, its implementation is now complicated in having to work around the current raft of sector reforms. These reforms combined with the undertakings to redress past service discrimination do not create an ideal environment for drawing general lesson on what works for cost recovery. Accordingly, the model structures detailed here are of more interest for what they could potentially deliver rather than for actual recovery achievements.

Despite these inconsistencies, supply achievements have been impressive with 7 million people provided with access to water services since 1994 at a cost of R4 billion. Also, considerable institutional reforms have taken place, which led to the establishment of flexible institutional arrangements. But despite all this, cost recovery records remain disappointing, and all institutional models are confronted to similar constraints linked to non-payment. A few success stories have emerged. On the whole, the free basic water policy has recently shattered hopes of seeing the development of self-sufficient water services, which would not need to rely on external subsidies for survival.

Finally, despite a broad policy decision to supply free basic sanitation, neither a definition of 'free basic sanitation' nor a detailed policy framework is yet in place. The same departments often deal with water and sanitation at the local level and financial viability of one service may affect the other. The free basic water policy therefore may also have negative impacts on sanitation provision and local authorities will have to consider the implications at the local level.

1.2 INSTITUTIONAL REFORMS AND INSTITUTIONAL MODELS

In a very short space of time, the water sector underwent dramatic institutional reforms that completely redefined the organisation of the sector:

1.2.1 *Legal reforms of the water sector*

During the Apartheid era, homelands were managing their own affairs independently from the rest of the country and, as a result, a large part of the country was largely neglected, with poor or non-existent infrastructure and very little information on the state of the services. In addition, there was no common institutional framework for organising water services in black and white areas. In 1994, a White Paper on Community Water Supply and Sanitation was passed and set out key objectives for the reforms. Since then, key pieces of legislation affecting the water sector have been enacted to provide institutional, legal and regulatory frameworks to underpin the provision of water services.

In particular, these institutional reforms have had as an objective to carry out a gradual process of decentralisation of water services delivery.

The Constitution of South Africa: the Constitution of South Africa brought a Bill of Rights, which includes the right of basic water supply to all South Africans (Section 27). The Constitution also allocates the responsibility and function for the provision of water supply and sanitation services to municipalities (Section 151) with National and Provincial governments being required to provide a supportive role. National government is also assigned the responsibility for developing norms and standards for service provision. In addition, National and provincial government can intervene in the event that Municipalities are unable to fulfil their constitutional obligations. But this intervention must be with the full participation of the municipalities so that their capacity to perform the functions can be developed in the process.

The ***Water Services Act (No. 108 of 1997)*** set out the common legislative framework for water services for all municipalities in South Africa. It replaced the Water Act of 1956, redefining the institutional roles and responsibilities and bringing the water services delivery framework in line with the Constitution and principles of local governance. The responsibilities of central government and the national Ministry (DWAF) were refocused mostly onto regulatory functions, (with the definition of methodologies for setting tariffs and service levels for example, and monitoring of the water service activities of local governments). Responsibilities as Water Service Authorities were granted to the district municipalities and the metropolitan municipalities (for the large cities). Water Service Authorities are in charge of monitoring and regulating service provision by the Water Service Providers at a local level. Those Water Service Providers can be the Water Service Authority itself (in the case of direct management) or any other type of provider, including private sector or possibly, civil society organisation. The Water Service

Authority would need to sign a contract with the provider in order to ensure adequate provision of those services.

DWAF, the Minister of Water Affairs, was assigned a regulatory role, with publicly-owned water boards being assigned the role of bulk water service providers to municipalities within their area of supply. This was in sharp contrast to DWAF's role up to the Act (and still to date, due to the difficulties of carrying out the transition), which was closer to one of water service authority and provider, especially with the running of large supply schemes in rural areas.

In more detail, DWAF's main regulatory responsibilities are as follows.

- To set national norms and standards (and, in particular, minimum levels of service);
- To legislate with regard to municipal functions (including minimum procurement rules);
- To monitor performance;
- To set minimum reporting requirements;
- To set overall tariff policy;
- To encourage regionalisation in order to achieve economies of scale.

Finally, DWAF is also in charge of controlling water resources, and remains responsible for the management of a number of large rural water schemes.

The 1997 Act assigned the role of ***Water Services Authority*** (WSA) to local government, entrusting it with the responsibility of providing access to affordable, sustainable water services to all existing and potential consumers in their areas. According to the Act, WSA can act as service providers within their areas or enter into a water services contract with a service provider to perform these functions on its behalf, or enter into a joint-venture agreement to jointly perform this function, with the condition that it has to consider all the public providers capable of providing this function before entering into an agreement with a private provider[1]. Specifically, WSAs are in charge of the following.

- To balance the needs of stakeholders, in terms of granting abstraction and discharge licences.
- To achieve the requirements for water service provision set by DWAF, and in particular, to set tariffs and determine levels of service at a local level.
- To enter into contracts with Water Service Providers (WSPs) best able to achieve these requirements and where such contracts are signed, to monitor the contract.
- To report to DWAF.

[1] Note that these reforms essentially alter role of other stakeholders such as NGOs . In the new South African strucutre DWAF is the main conduit for funds that may formerlly have been channeled through NNGOs at specific projects. NGOs must now function and compete as service providers.

In addition, the Act defined the roles and responsibilities of ***Water Service Providers (WSP)***, water service intermediaries and water service committees. WSPs can be a public, private or mixed entity, or the municipal government itself. In practice, WSPs are divided between bulk supply providers and retail supply providers. Water Boards are usually 100% publicly owned: they produce and treat water which they then sell-on to municipalities. There are about 8 Water Boards providing this kind of services in the main urbanised areas of the country - in between, these services are under DWAF's responsibility.

1.2.2 *Local government reform and impact on Water Services*

Legislation affecting the structure of municipal government has had a substantial impact on the way water services are delivered.

The ***Municipal Structures Act (1998)*** and the ***Municipal Structures Amendment Act (2000)*** set up the basis for the establishment of municipal government, distinguishing between: Metropolitan Municipalities (Category A), Local Municipalities (Category B) and District Municipalities (Category C). It defined the way in which municipalities were to be established, the way councils are to function and the division of powers and functions between municipalities. The 2000 amendment assigned responsibility for the water service authority function to Category C municipalities (although Category B municipalities can be authorised to perform the WSA function by the Minister of Provincial and Local Government) and to Metropolitan Municipalities (Category A) in metropolitan areas (the largest cities, such as Durban, Johannesburg, Pretoria or Cape Town).

District municipalities are one level up from local municipalities in the sense that their area of responsibility may include more than one local municipality, particularly in rural areas. The objective of this reform was to minimise the risk of a situation whereby municipalities are too small to provide services in a competent manner. One issue with this reform, however, is that "district councils" do not have any real legitimacy and structures attached to them, since there were relatively recent creations, and are more akin to just an "empty shell". In addition, according to current arrangements, Category B municipalities (local municipalities) receive the equitable share from the central government, i.e. a nominal subsidy per person below the poverty threshold in the municipality's area, whereas category C municipalities (district) are responsible for the provision of water services. As a result, these funds cannot be directly allocated to the water sector and a number of problems with fund transfers, including timing and overall allocation, means that the water sector is lacking in necessary funds to develop as fast as needed.

Finally, the new demarcation, or modification of municipal government boundaries, has had a substantial impact on the organisation of water services. This reform was initiated in order to eliminate the distortions inherited from

the Apartheid regime, with formerly predominantly urban areas were made responsible for a vast rural hinterland. Following a transitional change in demarcation, the permanent demarcation was done in December 2000, just prior to new local elections. Despite being there on paper, this transition has yet to be completely carried out, due to mental barriers but also, due to limits affecting human and financial resources. But in terms of water service provision, it raises an enormous challenge for water service authorities, whose scope of services was considerably expanded to include areas with very low service and cost-recovery levels.

1.2.3 *Implications from the separation between WSA and WSP*

The clear demarcation between Water Service Authority function (WSA) and Water Service Provider function (WSP) has introduced clearer responsibilities for water service management and can give rise to any type of permutations for performing water service provider functions. This research looked at many of these combinations to assess their merits in terms of service delivery and cost recovery potential.

Projects examined included:

Direct public provision: such as in Kruegersdorp or Durban Metro. Direct provision is usually in the form of a ring-fenced municipal service. These entities are focussing on commercialisation as a way out of the financial deadlock. However they are unsure whether the political climate in South Africa will allow this to happen.

Public-public: partnership: Rand Water through Odi retail in Winterweld (although Rand Water was basically forced by DWAF to go in and provide services in the first place);

Public-private partnership: Jowam in Johannesburg, with an international private operator (WSSA) signing a 4-year management contract with the municipal utility, recently separated from the municipal services.

Tri-sector partnership (with Durban BPD or particularly with the BoTT approach).

Community based models: Smaller scale stand-alone projects in partnership with NGO or engineering consulting firm inputs

South Africans have been very creative at inventing new models for water service provision (including the private sector and the civil society sector, in either bilateral or tri-sector partnerships) and sometimes, a little bit too quick at dumping them, on the basis of assumed failure. For example, the BoTT model (see below) has been recognised as a useful innovation in a crisis environment. Despite criticism of the cost of the BoTT approach DWAF is

currently developing thinking about what the continuation of the BoTT should be. Various alternatives are being considered.

1.3 COST RECOVERY

1.3.1 *Understanding of cost-recovery concepts*

In South Africa, cost-recovery is usually understood as being an indicator of revenue collection rather than an indicator of revenues as a percentage of incurred costs. This is largely a reflection of the particularly poor record of payment at national level.

Furthermore, two strands of payment culture are prevalent among consumers: a culture of non-payment and the non-payment culture. The former, suggests that people do not pay because there is an historical habit of not paying for public services (such boycotts were seen as key during the Apartheid years).The latter suggests that people do not pay because they do not know why they should pay.

1.3.2 *Cost-recovery performance*

The fluid institutional arrangements and varied interpretation of cost recovery means that it currently difficult to generalise about performance. Use of prepayment technologies and the increased use of private contractors to service these technologies and offering revenue collection functions can be foreseen.

However, the basic non-payment culture is prevalent for all service providers irrespective of location. For example, the issue of revenue collection being separated from operation and management functions was raised in several contexts.

In the case of Jowam in Johannesburg, only revenue collection from the largest customers has been transferred, and Jowarn has no control over revenue collection of those who don't pay at present. In some community-based organisations, there is a similar problem. Under the new decentralised arrangements if the district municipality has control over fund management, these communities are obliged to channel funds upwards thereby depriving themselves of a very important management tool.

1.3.3 *Subsidy arrangements*

Given the very poor record at cost-recovery, the water sector in South Africa has so far subsisted and developed thanks to the provision of subsidies from the central government.

National Subsidy Arrangements

The primary source of financing for local government remains local taxes and other revenues levied and collected by municipalities themselves. However, the national government provides part of the finance through the *equitable share grant*, which is an unconditional grant that goes direct from national government to the District Municipalities to be spent according to their budget priorities.

The allocation of the equitable share has risen rapidly in 2000/1 and is projected to increase further in 2003/4. The equitable share grant will eventually equate to about R20 per rural family per month, which is considered to be insufficient for the cost recovery of free water (see below on the free water policy). Local government will also receive conditional grant funding. The implications for local authorities of the increases in the equitable share will be a general increase of the average grant per poor household.

DWAF Operating Subsidies

At present substantial subsidies to the water sector are occurring through the support by national government of the operating costs of DWAF water supply schemes. These schemes are in the process of being transferred to local government. In general a re-allocation of the current operating subsidies should support a free basic water policy. At present these subsidies are not well targeted, however, and there are low levels of cost recovery in many of these schemes. There are even indications that since the free basic water scheme, cost recovery has declined.

Local Level Subsidies

The most important means of financing services at the local level remains locally raised revenue through cross-subsidisation. In the case of more populous municipalities with large urban cores, this system can work well, as the tariff can be adjusted upwards for those that use more than 6kl of water. However, in the more rural municipalities, the number of consumers who can be taxed with a higher levy is very small, therefore this system doesn't work in these areas.

1.3.4 *Impact of politics: the Free Water Policy*

But, of course, any cost-recovery story in South Africa should always be broken down to "before" and "after" the Free Basic Water Policy.

Thabo Mbeki announced the free basic water policy in December 2000 as an essential aspect of poverty reduction in South Africa. But the imitative has been criticised in some sections of the WATSAN community The policy is to provide 6000 litres of water per month to a household of eight people, in accordance with the World Health Organisation basic level of water supply. The status of implementation of Free Basic Water by local authorities on 1 July

2001 (which was set as the deadline for implementation) revealed that approximately 23 million people were being served with Free Basic Water, in about 50% of the district municipalities of South Africa.

A Free Basic Water Strategy Task Team chaired by SALGA and including as members DWAF, DPLG, National Treasury, Mvula Trust, Development Bank of South Africa and the South African Association of Water Utilities was established to spear head the 3-stage implementation programme. Free basic water is to be funded using a combination of the equitable share of revenue of local government (see above) and internal cross-subsidies from appropriately structured water tariffs in a manner that best reflects the specific situation in the respective local government area.

All municipalities were expected to start implementing the free basic water policy from July 2001. However, it was recognised that some municipalities may not have the capacity to implement the policy to a full extent immediately. Therefore, it was recommended that policy implementation be approached by developing orders of strategy.

In theory, there might be potential advantages of the free basic water policy given that there are a few successful examples. In particular, Durban Water Metro (see case study below) claims that such policy is actually cheaper than paying for administrative costs to collect from low-volume and low-income users and higher income areas are able to subsidise the scheme. Indeed, whoever consumes more than $6m^3$ has to pay the full cost of its consumption. However, the situation in Durban is quite unique when compared to the rest of the country: the Metro is relatively industrial and has relatively affluent domestic customers, so that both categories can afford to cross-subsidise poor consumers. Quite apart from any practical advantage, the main advantage is also for politicians to increase their popularity. But such advantage is by far too short-term orientated, compared to the potential benefits that could be extracted from sustainable WATSAN projects over the long-term.

Indeed, in many other municipalities, the disadvantages of the free basic water policy are patently clear. They include:

- Dependency on external subsidy sources;
- Disempowerment of community structures;
- Devaluation of water, of which the economic value is completely lost;
- Destruction of assets through lack of ownership;
- Cost escalation of capital and maintenance;
- Focus on subsidies to connected customers, with a lack of clarity about how network extensions are going to be funded.

The Free Basic Water Policy was basically a political promise, building on a long history of promises of free services. Politicians introduced it before administration had actually thought about implementation, which means that a number of problems have emerged. As a result, many municipalities are still

grappling with the idea and how they can possibly implement it in practice. Although the FBWP might affect the need for pre-paid meters, the conclusion from most operators is that they are most useful as a way to control consumption than as a way of increasing revenues. Therefore, the FBWP does not affect their technological choice, provided the smart cards (or tokens) can be pre-programmed to allow for the free water allocation.

For less affluent municipalities and especially rural areas, this policy will be costly and therefore, might be impossible to implement. Consumption is well below the recommended lifeline allowance of 6 cubic meters, which means that there would be no revenue collection at all. With limited potential for cross-subsidisation and insufficient transfers from central governments, many municipalities and village water committees have to find ways round the free water policy in order to avoid bankruptcy. And in fact, many poor customers have understood that long-term financial viability of water systems is in their interest, and simply continue to pay.

Strategies currently used by the municipalities for the free water policy include a combination of rising block tariffs, often with a low rate for the first block, and targeted rebates to poor households are being used to provide pro-poor subsidies. DWAF's consultants (PDG) are actually recommending a number of "ways around" the free water policy, such as the payment of membership fees or other forms of payment.

Table 1 ***Subsidy Approaches in free water case studies***

Municipality	Tariff Structure	Subsidy Approach & Income Structure
Durban (Metro)	Rising block tariff, zero block 1 (6kl) to all	Internal cross subsidies & service level options
Tshwane (Metro)	Rising block tariff	Targeted internal cross subsidies through indigents policy (in old Pretoria area)
East London/ KWT(B1)	Rising block tariff in East London and a flat charge/kl in King Williams Town	Targeted subsidies through indigents policy
Polokwane (B2)	Urban areas rising block tariff, low block 1	Targeted cross subsidies through indigents policy and equitable share
George (B2)	Flat rate and declining basic availability charge with service level	Targeted cross subsidies via indigents policy and equitable share
Volksruct (B3)	Fixed monthly charge	Targeted rebate to the poor (9kl free) funded from equitable share
Lichtenburg (B3)	Rising block tariff, zero block 1 to all 5kl)	Internal cross subsidies (equitable share used for bad debts)
Douglas (B3)	Two block regressive tariff	Targeted rebates to the poor (10kl free) through the indigents policy from the equitable share

Source: Department of Water Affairs and Forestry (DWAF) (May 2001) Free Basic Water Implementation Strategy Document

1.4 CASE STUDIES

1.4.1 *Rand Water and ODI Retail*

Rand Water is a publicly owned water board and the bulk water supplier for the region of Johannesburg (Gauteng). According to the Water Services Act (1997), Water Boards are permitted to undertake other activities (other than their primary functions of supplying bulk water), provided that this does not limit the Boards' ability to undertake their primary activity or place a financial strain on the entire operation. As a result, water boards can for example provide water services on contract or in joint venture with water authorities or provide other types of services, such as management, training and support services or catchment management services.

Following DWAF's initiative, it has signed a contract with municipalities in the ODI region for provision of retail services in former township areas. Given that the cost-recovery record is particularly poor in these areas, Rand Water has put considerable efforts in the development and installation of pre-paid meters, for both individual and standpipe connections. Pre-paid meters are seen as a way of keeping down costs through reducing losses from uncontrolled use.

1.4.2 *Kruegersdorp municipal water services*

Kruegersdorp is a municipality lying West of Johannesburg. Water services are provided through a municipal water company, which is ring-fenced from other municipal services but still falls short of being corporatised. Kruegersdorp is typical of formerly white municipalities whose boundaries have recently been extended in order to incorporate black townships. However, management quality appears to be significantly higher than in other municipalities: it is akin to the success story of municipal water and sanitation service management. Kruegersdorp municipality has also been experimenting on a large scale with pre-paid metering devices, in a variety of socio-economic environments. Its payment record has significantly improved since the start of these experimentations. This has been matched with particularly good budgeting practices. The municipality is currently considering a possible corporatisation of the municipal services, which should be made possible thanks to the relatively good payment records.

1.4.3 *Durban Metro water and the BPD initiative*

In 1998, Durban Metro water (and the city of Pietermaritzburg) initiated the creation of two partnerships between themselves (public providers of water and sanitation services in Durban and Pietermaritzburg respectively), a private operator (Vivendi), a local NGO (the Mvula Trust), the Water Research Commission and the local bulk water supplier (Umgeni Water). The objective of these partnerships was to improve water services for the poor in Durban and Pietermaritzburg, particularly through the development of innovative approaches to water services provision. The partnerships were created

through two co-operation agreements, with one for each city, which outline roles, responsibilities and financial commitment for these partnerships. Powers in the partnership are equally shared, and financial contributions do not imply more weight in decision-making. (2)

New approaches to service provision developed by these partnerships did largely focus on addressing the cost-recovery challenge. It is in the municipality of Durban that the free water policy was first introduced in Durban, but this policy was largely seen as a cost-limitation mechanism in such a setting. Durban Water established that it would be cheaper to provide 6 cubic metres of water for free to everyone in Durban rather than to try and recover bills in areas that are difficult (and may be dangerous) to access or try and target subsidies onto poor consumers. In many township areas around Durban, payment records have traditionally been very low: there is either a "culture of non-payment" (inherited from the Apartheid era when boycott of services provided by the white rulers was a commonly used weapon) or a "non-payment" culture (which means that people have never paid for a service that was provided for free and do not see why they should start paying from now). In order to increase the financial viability of this policy, they have introduced a number of innovations on flexing service levels, with for example the introduction of restricted services (roof tanks are provided with just a daily allowance every day).

But Durban Water, one of the most efficient water utility in the country, is a special case, as it can easily recoup the costs of this policy through cross-subsidisation from a relatively rich household and industrial customer base.

1.4.4 *Kwa Zulu Natal rural services: Nkwambase*

ERM visited the Nkwambase project, in a rural area North of Durban in the Kwa Zulu Natal province. The project serves a total of 800 households. For this project, the development engineering firm Dynacon works as sub-contractor to Umgeni Water, which is the bulk water supplier in the region of Durban.

The approach is different however. Umgeni has installed conventional meters (with a lock to prevent tampering) Project operation was initially to be entrusted to a local Water Committee, with elected representatives from the community. However, this committee was disbanded once they ran out of money and had to be replaced by a small Task Team, with more competent and responsible people. This Task Team is managing in difficult times but hopes that a more conventional business unit would be put in place in order to manage the business. In financial terms, most people aren't paying so they have never paid their bill for bulk water to Umgeni. Arrears on bulk water payments have been amounting, but Umgeni, the Project Implementation Unit has not cut them off so far. They are hoping that the municipal council will

(2) Note that these partnerships received considerable support and attention from the Business Partners for Development initiative, for which the Kwa Zulu Natal projects are one out of eight pilot projects.

settle the accumulated debt. The cashier, representative of the task team, displayed some relatively good knowledge of the business. He said that they could not connect anyone who wanted to because costs can be particularly high, so they would need to increase the connection fee in order to cover those costs. In addition, he believed that they would need to increase the tariffs given that two increases in bulk water prices had not been reflected into their retail tariffs. However, they are dependent on the local municipality for agreeing tariff increases.

1.4.5 *Peddie South and the Eastern Cape BoTT project*

Contractual framework: the BoTT contracts

South Africa has created a new model for linking business, government and civil society stakeholders in the water systems development process. Rather than following the traditional buyer-seller relationship of the commercial contract, there is continued emphasis on "co-development", as exemplified by the BOTT contracts.

In 1997, DWAF signed BoTT (Build, operate, Train, Transfer) contracts with "Project Implementing Agencies" (PIA) in each of South Africa's four poorest provinces. Each PIA is a consortium between private sector actors and NGOs: for example, both the Northern Province (Metsico) and the Eastern Cape (Amanz'abantu) consortia are led by WASS (a subsidiary of Northumbrian Water) and have the Mvula Trust, a nation-wide NGO specialising in providing water services to the rural poor as partner for institutional and social development aspects. The four BoTT programmes were first established with the objective of carrying out 100 small-scale projects.

The rationale for designing this type of contracts was to accompany the municipal service reform and to allow a quick transfer of responsibilities for water and sanitation from central government (DWAF) to local governments. Given that in many poor rural areas, local governments did not have the capacity or the financial resources to take on such responsibilities in a short period of time, DWAF developed the BoTT concept for accompanying and overseeing this transfer.

The contracts themselves are very detailed management contracts designed using FIDIC contract formulation. They were let via a competitive tendering process, which used a scoring process to evaluate the candidates' skills and experience in the following areas of skills: design, construction, operation and maintenance (O&M), on-site sanitation and institutional and social development (ISD). In addition, points were awarded for Historically Disadvantaged Companies (HDC) who would act as shareholders and sub-contractors as well as use of community based labour and methods.

The contracts require the consortia to offer a "one-stop shop approach" covering these five areas of skill. Effectively, this is achieved through the

establishment of a project management structure (the "Project Implementation Agency"). The PIA is in charge of overseeing the services provided by the Lead Service Providers as well as any other company or community representatives that the latter supervise. Community representatives work as partners on the project, as members of the Project Steering Committees and Village Water Committees.

The overall objectives of the contracts are:

- To carry out assessment of community demand and willingness to pay for water supply services;
- to design a tariff structure and payment mechanisms which respond to the results of the assessment;
- to plan the scheme including water source investigation and development, environmental scooping and impact assessments, feasibility studies etc.
- to design and build a community stand-pipe network which responds to the identified need in accordance with the criteria required by the "Reconstruction and Development Programme" (i.e. 25 litres at 200m minimum standard);
- to operate the system, during the agreed operation and maintenance phase, including the collection of tariffs, to ensure that the designed scheme is robust technically and economically; and
- to manage the hand-over phase (or "Transfer") to local-government.
- To provide post transfer mentorship for the scheme.

These contracts are now coming to an end, as they were initially signed for two-years and renewed once. Both self-criticism (by DWAF, due to the relatively high cost of the programme) and external criticism (by NGO partners, due to their limited ability to strategically orient the projects) are running strong. However, it is generally recognised that these project management structures have been successful at delivering rapid improvements in service delivery with appropriate attention paid to the long-term sustainability of the schemes established in such a way. Private sector operators have been quick in recognising the interest of such approach, and are trying to win more projects outside the BoTT structure directly with local governments. Indeed, following that experience, DWAF decided to develop an "improved" BoTT model contract, which could be used directly by local governments wanting to call on the private sector to develop their water services on the basis of this "one-stop shop" approach.

Table 2 ***Advantages and disadvantages of the BoTT approach***

Advantages	Disadvantages
• Allows to make considerable public investment in a short time: speedy and efficient • Provides a good overall project management structure for running many small schemes • Integrated approach to project cycle • Draws on expertise from various disciplines for various tasks (business planning, construction, O&M, ISD, mentorship and transfer) • Moves away from a strictly engineering-driven approach to one where institutional and social development specialists can have a say about the project structure • Strong emphasis on building capacity, both at water service authority level and at village level • Helped the establishment of consortia centred on private operators who can now work on small-scale projects originating from local government on a more competitive basis	• No direct investment by the private sector • Costs are higher than if projects were implemented in a traditional way (although those added costs may be the price to pay for a speedier implementation) • Local governments were not sufficiently implicated into the process, which was decided and implemented before the local government reform • Insufficient emphasis on training of future water service providers • Few schemes have been transferred to date; difficult to assess the relative success • The impact on local service providers not included in the PIA might be severe, given that they can not compete for those projects during quite a lengthy period of time

1.5 *PEOPLE AND INSTITUTIONS MET IN SOUTH AFRICA*

- Richard Riddle, Managing Director, PSU International
- Paul Smith, Director, PSU International
- Manny Van Zyl, Operations Manager, PSU International
- Samuel P Molekoa, Project Co-Ordinator, Rand Water
- Kobie Mare, Operations Engineer: Water, Rand Water
- Dugald Ross, Operations Engineer, Rand Water
- Steve Kilbey, Rand Water
- Ian Palmer, Managing Director, PDG
- Mthobeli Kolisa, Consultant, PDG
- Jean-Pierre Mas, Operations Execuive, Johannesburg Water Ltd
- Gerhard R. Backeberg, Research Manager, Water Research Commission
- Martin Rall, The Mvula Trust
- Jamie de Jager, Regional Co-Ordinator, The Mvula Trust
- Martin Cooney, Area Manager, Amanz Abantu Services Ltd
- Mlungisi Bangani, ISD Co-Ordinator, Amanz Abantu Services Ltd
- Oliver Ive, Amanz Abantu Services Ltd
- David Still, Director, Partners in Development
- David A. Stephen, Director, Umgeni
- Minnie Venter-Hilderbransd, Mvula Trust
- Patrick Rousseau, Project Manager, Vivendi

- Graham Simpson, VKE Engineers Durban
- Lansan Marah, Sigodi, Marah Martin, Development Consultants
- Rod Alence , Sigodi, Marah Martin, Development Consultants

Public Institutions

- Dr Sylvain Perret, Associate Professor, University of Pretoria
- Rachild Hassan, University of Pretoria
- Helgard Muller, Director: water services intervention and operations support, Dept. Water Affairs and Forestry
- Hugh Sussens, Intervention and Operations Support, Dept. Water Affairs and Forestry
- Dave Rimmer, Dept. Water Affairs and Forestry, Durban
- Barry M Jackson, Policy Analyst, Development Bank of Southern Africa
- Craig Thompson, Deputy Director: Engineering Services, Amatola District Council
- Mike Rabe, Deputy Director: Water, Mogale City
- Peter Smith, Water Sector Field Manager, DFID
- Martin de Wit, CSIR