SecureWater: Building Sustainable Livelihoods for the Poor into Demand Responsive Approaches

UK Department for International Development (DFID)
Knowledge and Research in Engineering Sectors
Project Reference R8034

Final Technical Report
June 2005

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Executive Summary

Introduction

The *SecureWater* project purpose is to *increase understanding among interveners in the water sector of water-livelihood links, enhancing their capacity to eliminate poverty through demand responsive approaches.* The project developed out of a concern that new 'demand-responsive approaches' (DRA) to water supply and sanitation emerging in the 1990s had an inadequate understanding of community 'demand', and willingness to pay for new services, with implications for the well being of poor households.

SecureWater's six-month inception phase began in September 2001 and brought together researchers from five countries (India, Kenya, Malawi, Sri Lanka and Sudan). International partners included BGS, DFID, Environmental Economics UK, ITDG, Save the Children UK, the University of Southampton and the Water and Sanitation Program. Scoping studies undertaken in all countries during early 2002 were followed by a methods workshop in Sri Lanka in May, subsequent to which the project narrowed its research focus[1] to Sri Lanka and India. An additional (sanitation) study was led by ITDG in Kenya.

Research approach

SecureWater has adopted a broad research methodology combining institutional and policy analysis with tools of poverty assessment including sustainable livelihoods, gender analysis and household economy approaches. The research team paid particular attention to water as a productive asset and how sustainable schemes could provide benefits to the poor that went beyond health impacts and contributed directly to their *livelihood security*.

In India the *SecureWater* case study involved simultaneous research activities at national, state, district and village levels. The case studies were undertaken in Andhra Pradesh in Chittoor district by an Indian research team led by Deepa Joshi. Consultations with key stakeholder institutions in Delhi generated interest in collaboration from the World Bank Water and Sanitation Program (WSP) South Asia, the Rajiv Ghandi Drinking Water Mission, UNICEF, and DFID.

In Sri Lanka the *SecureWater* research team led by Rajindra Ariyabandu combined personnel from the Water Resource Secretariat (WRS) and the Agrarian Research and Training Institute (ARTI). Initial consultations in Colombo resulted in strong support and 'buy in' to project objectives from key stakeholder institutions. Subsequently the project team held regular briefings and updates which enabled a close working relationship with the National Water Supply & Drainage Board (NWSDB), World Bank Water Supply and Sanitation Project (CWSSP) as well as ADB consultants and NGOs involved in WSS development projects.

Key findings

SecureWater research findings show that the shift in water sector policy and associated process of institutional change are very much ongoing in the countries studied, but that interpretation of DRA in policy has varied significantly. The India case study, for example, highlights the uneven pace of reforms within the country and the multiple drivers of policy operating at different levels (national, state, district etc). While the basic principles of promoting consumer choice through decentralised provision are theoretically appealing, this has implied major changes in the roles and responsibilities of different stakeholders at all levels, hence the attendant challenge of institutional reform should not be underestimated. *SecureWater* research has also identified a number of challenges associated with implementation which can be broadly categorised in terms of the capacity of local level institutions to understand the nature of demand for water and to respond effectively.

[1] This was due to a 12-month funding hiatus from the end of the inception period to the initiation of field research activities and subsequent reduction in the project budget.

Country case studies have illustrated how changing livelihoods affect demand for services, which varies substantially between and within communities. Scheme design needs to balance demand for higher levels of service with basic needs and take account of short-term and long-term trends in livelihood patterns and resource availability. Detailed analysis of household water economy across different wealth groups has revealed the extent to which household incomes fluctuate between good and bad years, and why it is important to develop more flexible arrangements to accommodate variable financing capacity.

Analyses in Sri Lanka have shown that both the relative costs and relative benefits of accessing water are often greatest for the poorest households but they are often unwilling or unable to opt for scheme membership. The number of so-called 'drop outs' is not insignificant and has implications for universal access targets, but also the sustainability of schemes. The India study has highlighted the heterogeneous nature of user groups and the complex of social, political and economic factors affecting the articulation of 'demand', which seriously questions the assumption that achieving consensus around a single communal supply arrangement is in fact possible and desirable.

In addition to highlighting the complex nature of demand and the way it is articulated, *SecureWater* research has focused on the capacity of local institutional environments to implement policy and ensure the response is appropriately poverty-focused. Case study analysis suggests that water users require considerable external support in order to make informed choices regarding the individual and collective costs and benefits of different supply arrangements and service options. The existence of an intermediary organisation capable of facilitating these discussions is a key factor in determining whether DRA amounts to more than just a 'supply-led plus participation' approach.

A particular area of concern in the context of poverty reduction strategies is how to balance demand for higher levels of service with equity in basic service provision. The capacity of community-based organisations to manage and fund WSS schemes, and devise tariffs which enable cross-subsidisation, varies substantially. The development and implementation of DRA in parts of Sri Lanka is relatively sophisticated (as compared with Africa, for example). Piped schemes with individual metered connections are common, but these can be prohibitively expensive and their successful operation depends heavily on the existence of capable CBOs. Important questions surround the legal status of CBOs and their relationship to various decentralised institutions of government.

DRA implementation to-date in both India and Sri Lanka has been mostly linked to major donor projects or government pilot programs. Successful scaling-up depends on establishing a framework of decentralised support organisations capable of responding flexibly to changing patterns of demand for water in the longer term, and also in turn that wider governance questions surrounding service provision in decentralising environments are addressed.

A key conclusion of the *SecureWater* research is that an understanding of linkages between water and rural livelihoods is essential if the potential of DRA to balance equity and efficiency objectives, and secure improved access for the poor on a sustainable basis, is to be realised. On the one hand this demands a more explicit emphasis on poverty and equity in DRA policy and documents at all levels, which has been the objective of *SecureWater*'s dissemination and uptake activities. On the other, it requires a massive concerted effort to build the capacity of local level institutions to understand their new roles and responsibilities, and to implement them. A key objective of the *SecureWater* DST has therefore been to support decision-making processes at different levels by highlighting issues and challenges and identifying possible approaches to dealing with them.

Decision support

In parallel to the country case study research, but with full local collaboration and feedback, UK-based partners began developing a prototype 'decision support tool' (DST) in 2003[2]. It was designed specifically to enable participatory content development and virtual networking among researchers

[2] Software development and technical support provided by *Terrainview*

and practitioners and makes use of Linux-based 'wiki' software[3]. Once the basic functions were established the tool was demonstrated and tested during a series of small workshops in Sri Lanka and India. Various features have subsequently been modified on the basis of feedback to maximise usability and accessibility for country partners. An important additional function is the ability to create simpler CD versions to allow offline working and extension to users without internet access. The DST is currently web-based to maximise user-participation in content development and allow simultaneous uploading from different countries. Separate templates have been used to distinguish India- and Sri Lanka-specific material but the entire site is searchable to promote learning across countries. The design allows for continuous addition of new material and it is intended that the DST should continue to evolve beyond the end of the project. ODI has handed over responsibility for site management to in-country partners. The *SecureWater* DST is currently hosted at www.securewater.org.uk.

Dissemination and uptake

Dissemination of the project's major thematic focus, methodological approach and research output has been a central activity from inception to conclusion. *SecureWater* hosted a side event at the Bonn International Freshwater Conference in December 2001, providing an initial platform for the team to receive feedback on key concepts and approaches from an international audience. Final workshops in India (consecutive workshops at National, State and District levels) disseminated our research findings to policy makers and practitioners involved in implementing DRA, and encouraged uptake of the DST at different levels. The main Delhi workshop was held in collaboration with UNICEF India as part of their annual donor conference and attended by senior UNICEF WSS officials. Strong interest was shown in both using and contributing to the existing DST. In particular the Water and Environmental Sanitation Network (WESNET) in South Asia wishes to use the DST as a platform for networking and information exchange and has agreed to take over responsibility for future development of the site.

In Sri Lanka initial research results were discussed at a national level workshop in December 2003, and a core group of stakeholders identified to participate in development of *SecureWater* decision support tools to assist decision making and implementation in Sri Lanka. The NWSDB expressed particular interest in using the findings of the *SecureWater* project to develop national guidelines for targeting those excluded under current approaches. A series of six small workshops allowed exchange of information and the documentation of best practice via the DST.

Global dissemination of *SecureWater* outputs has been ongoing throughout the life of the project. *SecureWater* presented a poster and project information in the ODI Water Policy Programme booth at the World Summit on Sustainable Development in Johannesburg, September 2002. Subsequently, the team organised and hosted a Film and Photographic Exhibition in March 2003 at the Oxo gallery, Southbank, London, marking both the UN International Year of Freshwater and the two-week run-up to the 3rd World Water Forum in Kyoto, Japan[4]. The commissioned film by *Wild Dog Ltd* entitled *SecureWater: Water, Livelihoods and Demand-based Approaches* documented emerging research issues and was accompanied by photographs taken by freelance photographer Andy Johnstone (Panos Pictures)[5] in India, Sri Lanka and Kenya. The exhibition raised public awareness of issues and challenges facing poor people in securing access to water in Africa and Asia and was subsequently displayed in the 'atrium' at DFID during the World Water Forum. The film was presented as part of the ADB-funded Water and Poverty Initiative in Kyoto. In April 2004, the film was also selected by the UN for screening as part of an issue-based webcast on water supply, sanitation and human settlements during the Commission on Sustainable Development (CSD 12) meeting in New York[6].

In addition research findings have been presented by partners from India and Sri Lanka at an ODI seminar on 'Water, Poverty and Social Exclusion' as part of an ESRC-funded seminar series entitled

[3] One of the best known existing applications is the Wikipedia (http://www.wikipedia.org)
[4] These activities were funded separately, including support from the DFID Sustainable Livelihoods Support Office (SLSO).
[5] http://www.focusphotos.com
[6] www.developmentvoices.net

'Water Governance Challenging the Consensus', March 2005 and project publications disseminated at the World Bank Water Week, Washington, March 2005 and the Stockholm World Water Week in August 2005.

As part of its mandate *SecureWater* has established strong links throughout with other DFID-funded KaR projects, including establishing active membership of the Thematic Group on Productive Uses of Water at Household Level, hosted by the International Water and Sanitation Centre in Delft, through discussions with WHIRL. The Kenya case study in Nairobi involved close collaboration with the University of Southampton Gender & Sanitation project and the WEDC KaR project on Water Vendors. The *SecureWater* team has also worked collaboratively on the DFID-funded *ComMan* project, including inputs by the UK team on institutional and social development issues and by the India team to the *ComMan* final workshop on 'Community-based management of groundwater in India', Delhi, January 2004. The UK team has also presented research findings at a workshop on 'Improving Rural Water Management in India: policy issues from DFID research projects', held in Cambridge, January 2005. Three journal articles by the team have been prepared for regional and international publication in 2005.

1. Introduction

1.1 Background to the research

SecureWater emerged from livelihoods thinking in the water sector during the 1990s that addressed perceived deficiencies in traditional health-based approaches to water supply and sanitation. At a DFID-funded workshop (organised by Save the Children UK) in Harare in late 1997 a range of water and sanitation projects presented their experience of the livelihoods aspects of projects in east and southern Africa. The Water and Sanitation Program-Africa (WSP) also presented analyses of both the economics of water provision and the emerging Demand-Responsive Approach (DRA). At this and subsequent meetings the need to build into DRA a more effective understanding of water, livelihoods and poverty issues became apparent. The *SecureWater* research project responded to this need and received funding under the DFID KaR programme in 2001.

1.2 Project goal, purpose and outputs

Project goal

To raise the well-being of the rural and urban poor through cost-effective improved water supply and sanitation; and to improve the availability of water for sustainable food production and rural development.

Project purpose

To increase understanding among interveners in the water sector of water-livelihood links, enhancing their capacity to eliminate poverty through demand responsive approaches.

For many decades water supply and sanitation (WSS) policy focused on achievement of *health* benefits through supply of 'safe' water and sanitation services. This policy emphasis was informed by basic needs approaches of the 1970s and the ethos of 'water for all' promoted during the 1980s 'Water Decade'. However, persistent failure to extend coverage on a sustainable basis led to a questioning of existing approaches in the early 1990s. The concern was that overly supply-led service-delivery had been financially unsustainable and had therefore failed the poor. The subsequent emergence of Demand-Responsive Approaches (DRA) reflected a wider shift in water sector thinking towards treating water as an *economic good*[7] and promoted greater involvement of water users in the process of selecting, implementing and financing the delivery of water and sanitation services. Proponents of the approach, notably the World Bank and the Water and Sanitation Program, have supported its uptake across Africa and Asia.

Box 1: Key principles of DRA summarised

- Informed choices made by communities through participatory planning and community involvement in implementation in order to ensure ownership
- Complete community management responsibility for operation and maintenance (O&M)
- Cost recovery – capital cost sharing (expression of demand and 'ownership') and 100% O&M
- Promoting more options for service delivery
- Integrating water supply with sanitation, environmental management and hygiene education
- Targeting the poor
- Supporting integrated water resource management

Source: WSP East Africa, 2001

The emergence of Poverty Reduction Strategy Papers (PRSPs) in the late 1990s reflected a growing consensus on the importance of poverty reduction within debt relief, government expenditure and donor support processes. The PRS agenda challenged water sector stakeholders to better understand and articulate water, sanitation and poverty linkages above and beyond the oft-stated potential health

[7] A shift enshrined in the 'Dublin Principles' - International Conference on Water & Environment, 1992.

benefits. How approaches such as DRA, which focused on financing sustainability, could reconcile equity and efficiency objectives and the goal of poverty reduction became a major concern and key research question within the *SecureWater* project.

Project method

SecureWater activities aimed at targeting key decision takers and implementers at all levels, increasing their capacity to make informed decisions that could help to achieve increased poverty reduction, as well as lead to more sustainable service provision to the poor. This variously entailed: engaging with donor agencies and policy makers involved in DRA implementation and scaling up, the establishment of close research links with government agencies and institutions at the national and sub-national level, and awareness-raising of the core objectives of the project amongst interveners to facilitate effective dissemination and ensure uptake and piloting by practitioners.

SecureWater research utilised sustainable livelihoods and household economy approaches to analyse the complex and multiple linkages between water access and livelihood assets and strategies of poor households, and the one hand and their relationships to the sustainability of programme interventions on the other. A key focus was on recognising water as a productive asset that is put to a wide range of uses at a household level in order to secure food and non-food income.

Understanding the complex nature of 'demand' and the way it is articulated at community level, and the capacity of local-level institutional environments to implement policy and ensure the 'response' is appropriately poverty-focused, were major project objectives. Country case studies highlighted macro level policies and how resulting institutions and decision making processes could translate into micro-level livelihood outcomes. This informed an understanding of the potential costs – direct and indirect – as well as benefits for poor water users arising out of the policy shift to DRA, and reflected on wider governance questions surrounding 'pro-poor' service provision in decentralising environments.

Project activities and outputs

The *SecureWater* project has been coordinated by ODI Water Policy Programme in London with inputs from other UK-based institutions, including ITDG, Save UK and BGS. Project activities in case study countries were carried out in collaboration with local research partners.

***Inception phase** (August 2001 to May 2002)*[8]

1. *Inception workshop*: the project start-up workshop was held in Nairobi in September 2001 and brought together all the key research partners to discuss objectives and approaches.
2. *Scoping studies in five countries*: research teams conducted short scoping studies and identified suitable fieldwork sites in: India (Andra Pradesh (rural and urban) and Orissa); Kenya (Mukuru Kwa Ruben, Nairobi); Malawi (Salima district); Sri Lanka (Hambantota district) and Sudan (North Darfur).
3. *Concept paper presentation*: the project arranged a side event at the Bonn International Conference on Freshwater (December 2001) in order to present the *SecureWater* concept to an international audience for discussion and feedback.
4. *Methods workshop*: this was held in Sri Lanka in May 2002 to enable detailed development and testing of methodological approaches. It included six days of field-based training in techniques of livelihoods analysis and household economy assessment and elaboration of the project research framework.

[8] Unfortunately there was a 12mth funding hiatus between the Inception phase and the Research phase. During this period efforts were made to maintain the project profile and maintain the strong research and dissemination links established during the Inception period. This included production of a *SecureWater* film and organising a film and photographic exhibition to mark World Water Day in March 2003. Funding resumed in June 2003 although the scope of the project was significantly reduced.

Research phase *(May 2003 to June 2004)*

1. *Country case studies*: research was conducted in India and Sri Lanka with in-depth fieldwork in rural areas. An additional (extra budgetary) urban case study was undertaken in Kenya, with fieldwork in Nairobi.
2. *National workshops*: workshops were held in Sri Lanka and India to present emerging research findings for discussion and feedback among national level stakeholders, and identify opportunities for collaboration in development and piloting of decision support materials.
3. *Design of prototype decision support tool*: an interactive, web-based tool which enables information exchange among specific user communities.
4. *Production of case study report*s: detailed research findings were edited, externally reviewed, and published locally in Sri Lanka as *ODI Water Policy Reports*.

Dissemination and uptake *(June 2004 to April 2005)*

1. *Development of decision support tools*: the DST makes use of Linux-based software to facilitate participatory content development and virtual networking among researchers and practitioners. Initial content was developed by research partners.
2. *In-country piloting*: a series of small workshops was held in both Sri Lanka and India with key stakeholders to demonstrate, pilot and refine the DST structure on the basis of feedback. Editing rights were then gradually extended to a wider user group.
3. *Final project workshop in India*: consecutive workshops were held at National, State and district levels to disseminate research findings to policy makers and practitioners involved in DRA implementation and encourage uptake of the DST at different levels.
4. *Ongoing DST development*: the DST enables registered users to continuously contribute additional material and allows simultaneous uploading from different countries. Responsibility for site management will ultimately be handed over to in-country partners.

Additional activities

1. Poster presentation at the World Summit on Sustainable Development in Johannesburg, South Africa, September 2002.
2. Active participation in the Thematic Group on Productive Uses of Water at the Household Level (ProdWat), coordinated by IRC in Delft, since 2003.
3. *SecureWater* Film and Photographic Exhibition, Oxo gallery, Southbank, London marking the UN International Year of Freshwater, March 2003.
4. Screening of the *SecureWater* film as part of the ADB-funded Water and Poverty Initiative at the 3rd World Water Forum in Kyoto, March, 2003.
5. Inputs to the *ComMan* project workshop on 'Community-based management of groundwater in India', Delhi, January 2004.
6. Workshop on Improving Rural Water Management in India: policy issues from DFID research projects, January 2005, Cambridge.
7. Dissemination of research findings at the World Bank Water Week, Washington, March 2005 and Stockholm World Water Week in August 2005.
8. Presentations by research partners from India and Sri Lanka at a seminar on 'Water, Poverty and Social Exclusion' as part of an ESRC-funded seminar series entitled 'Water Governance Challenging the Consensus', ODI, March 2005.

Research outputs[9]

1. ODI (2003) SecureWater? *Water Policy Brief No. 4*, Water Policy Programme, Overseas Development Institute, London.
2. ODI (2003) *SecureWater: Water, Livelihoods and Demand-based Approaches*. A film by the Water Policy Programme, Overseas Development Institute, Wild Dog Films, UK.

[9] Available on the project website www.securewater.org

3. Ariyabandu, R de S. & M.M.M Aheeyar, (2004) *SecureWater* through demand responsive approaches: the Sri Lanka experience. *Water Policy Report No. 3*, Water Policy Programme, Overseas Development Institute, London.
4. Joshi, D (2004) *SecureWater* – Whither Poverty? A case study of the Water Supply Programme in India. *Water Policy Report No. 4*, Water Policy Programme, Overseas Development Institute, London.
5. ITDG (2005) *Livelihoods and Gender in Sanitation, Hygiene & Water Services among Urban Poor*. Maili Saba Research Report, March 2005. ITDG – Practical Action.
6. *SecureWater* Decision Support Tool www.securewater.org.uk. Facilitated by ODI Water Policy Programme.
7. Ariyabandu, R de S. & M.M.M Aheeyar, (forthcoming) *Household Water Security through Demand Responsive Approaches*, Submitted to Asia Pacific Journal on Rural Development, Dhaka, Bangladesh.
8. Joshi, D (forthcoming) *Poverty and Exclusion – Lessons for a Demand-Responsive Approach to Water Management*, Submitted to Economic and Political Weekly, Delhi, India.
9. Slaymaker, T., Nicol, A et al (forthcoming) *SecureWater? Lessons from Demand Responsive Approaches in South Asia*.
10. Environmental Secretariat (2005) 'Livelihoods and Gender in Sanitation Hygiene and Water Services Among the Urban Poor, *Environmental Sanitation, Field Update 4th July 2005*.

2. Methodology and research activities

2.1 Inception phase

The *SecureWater* project brought together key agencies involved in water supply and sanitation, water resources management in rural and urban areas, to address both policy and practice issues surrounding development and implementation of demand-responsive approaches (DRA). The central focus has been on improving impact on the poor through building sustainable livelihoods approaches into DRA implementation.

The Inception Workshop, held in Nairobi on September 11th 2001, involved all key research partners in discussing project objectives and approaches. Presentations detailed the development of DRA in the context of a global shift in water policy and its ongoing uptake in different countries around the world. WSP East Africa noted a number of challenges faced in scaling up DRA in policy (financial, institutional and political), including considering how this could be achieved through the development of Poverty Reduction Strategies. Discussion of methodological approaches such as willingness-to-pay highlighted gaps in conceptual understanding and the need to improve understanding and assessment of 'demand' among sector practitioners. The relative strengths and weaknesses of other approaches (notably sustainable livelihoods and household economy approaches) were then discussed in order to try and identify areas of overlap and complimentarity.

A key concern identified was that DRA is intrinsically linked to finance with an implicit assumption that demand, as expressed by poor communities could be equated with willingness to pay for a particular kind of service. Important questions surround the extent to which the type and level of service offered is itself 'demand-driven'. Furthermore, the willingness and ability of poor households to contribute, in cash or in kind, to the costs of financing and managing water vary significantly. Supply sustainability was unlikely to be achieved unless these issues could be addressed. There was an identified need therefore to:

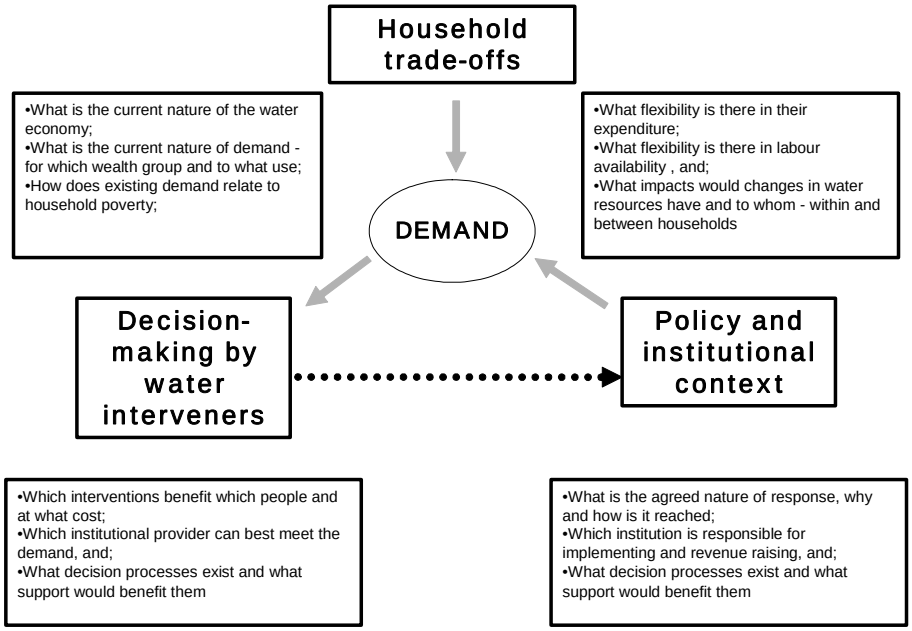
- Increase understanding of the principles and aims of DRA, and the implications of adopting such approaches;
- Identify key issues/entry points where intervention could be strategically important for effective poverty reduction, either at local level or policy level;
- Build the capacity to respond through decentralised decision-making bodies, communities and sector practitioners;
- Provide appropriate technological choices for the poor;

- Improve assessment, monitoring and evaluation of the poverty impact of water supply interventions.

Following the Inception workshop, scoping studies in five countries mapped key issues for further analysis and identified suitable field sites for in-depth case study research. The *SecureWater* analytical framework was further elaborated and presented for discussion during a side event at the Bonn International Freshwater Conference in December 2001. This both raised the profile of the project amongst an international peer group and provided a platform for three of the five country researchers to present scoping study results. The event was well attended and included DFID and WSP discussants, chaired by Jon Lane.

The *SecureWater* concept was subsequently refined and a step-by-step method developed for thinking through the multiple linkages between water, poverty and livelihoods and the sustainability of water supply interventions under the DRA umbrella. The resulting approach to *SecureWater* assessment combined new tools of poverty analysis with established methods for assessing water resource availability, access and use. The methodological framework outlined in Figure 1 (below) formed the basis for the development and testing of appropriate forms of decision support.

Figure 1: *SecureWater*: Methodological framework

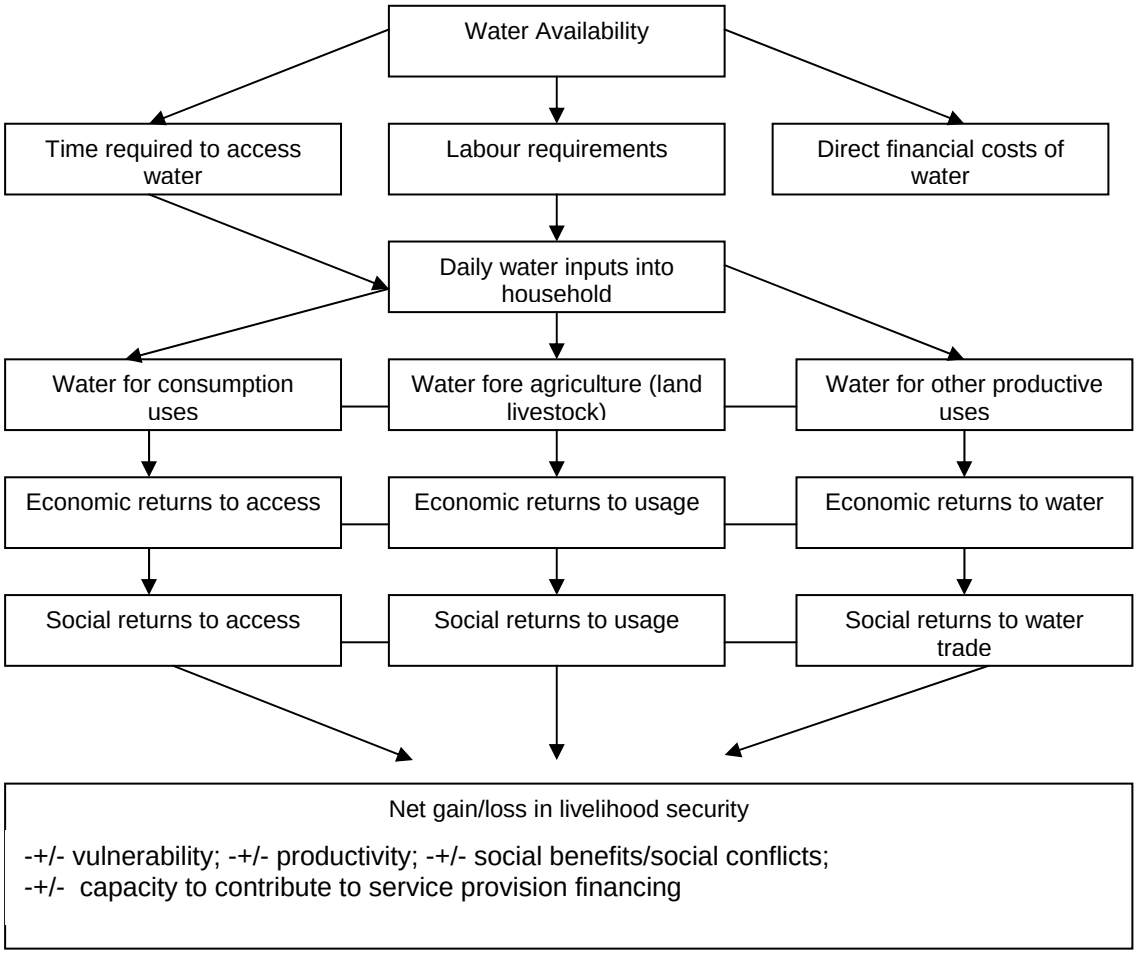


SecureWater assessment principally builds upon Sustainable Livelihoods (SL) approaches within which vulnerability is understood in terms of access to, and returns from, different livelihood *assets* (including water). Additionally, SL approaches help to highlight how policies, institutions and processes enable or constrain different livelihood strategies and require intervening agencies to look systematically at how macro level policies and resulting institutions and decision-making processes translate into micro-level livelihood outcomes. Adopting a SL approach within *SecureWater* assessment helps to suggest multiple entry points from the local to national level through which water supply interventions can be strategically important in supporting poverty reduction (for instance in facilitating access to key assets, transfer of technology and institution-building).

A key issue is understanding water as a *productive asset* for the poor as well as an economic good, which can be combined with other assets to generate financial and non-financial livelihood benefits. Furthermore, significant opportunity costs are associated with accessing water, both in terms of time/labour expended on water collection activities as well as cash expended at the source and transport costs. In short, access to water is often a key determinant of *livelihood security*, by impacting

on a broad range of other activities and assets. The project conceptualised this idea in the form of a model *household water economy* (see Figure 2).

Figure 2: Household Water Economy



To be operationally useful in the water sector, a dynamic model was needed to capture the complex interactions between water and other livelihood assets. *SecureWater* research adapted techniques from the Household Economy Approach[10] (HEA) and gender analysis to analyse these interactions and the impact of changes in water supplies within and between households. Describing the strategies people use to access food and income and the way different wealth groups within a community live and interact economically, HEA quantifies by wealth group the main sources of income and items of expenditure in a 'normal' year, and models the effects of shocks. It is particularly useful in predicting the ability of different households to cope with changes in economic conditions (e.g. crop failure, market loss, increased cost of basic services etc.), and in identifying vulnerable groups.

The *SecureWater* methods and tools workshop held in Sri Lanka in May 2002 led by Save UK enabled detailed development and testing of methodological approaches, including six days of field-based training in techniques of livelihoods analysis and HEA. Piloting of the approach was conducted in Hambantota district, one of the poorest in Sri Lanka and frequently affected by drought. Hambantota was also the focus of a major Asian Development Bank (ADB)-supported water supply and sanitation project implementing a demand-responsive approach. Simplified techniques designed for rapid assessment that were employed in two case study villages covered:

- Individual and group interviews using an HEA structure;

[10] For more information see SCF (2000) *The Household Economy Approach: A resource manual for practitioners.* Save the Children UK.

- Identification of basic characteristics and economic dynamics of principal livelihood activities;
- Characterisation of wealth groups based on livelihood assets including land, labour and livestock;
- Mapping of availability and use of water from multiple sources;
- Constructing a dynamic model of household economy in terms of food and non-food income through 'good', 'normal' and 'bad' years;
- Understanding seasonality in income and expenditure flows and plotting variations in food, cash and labour availability against variations in water resource availability;
- Establishing a basic data set that enables modelling of the impact of changes in water availability, access and use, on poor households – both within and between years.

The emerging model supported analysis of the likely impact of different types of water supply intervention on household livelihoods within different socio-economic groups. Specifically, it enabled interveners to assess the ability of a given type of household to meet new water charges under different economic conditions (i.e. implications of intra- and inter-annual variation in income) and changes to household income (and therefore capacity to pay), arising either directly from water interventions, or indirectly from associated changes in agricultural or other employment opportunities.

Figure 3: Expenditure distribution 'poor hh'

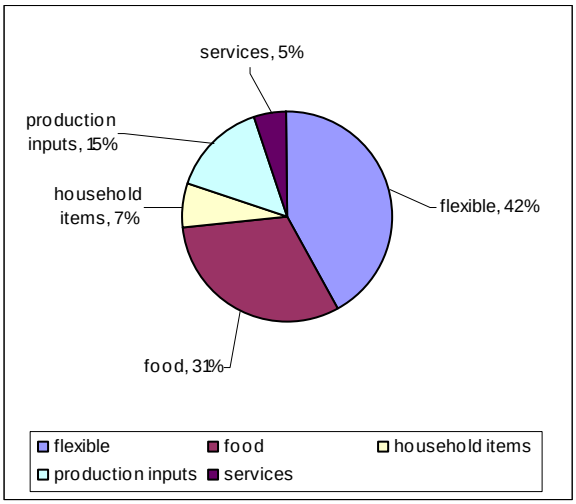
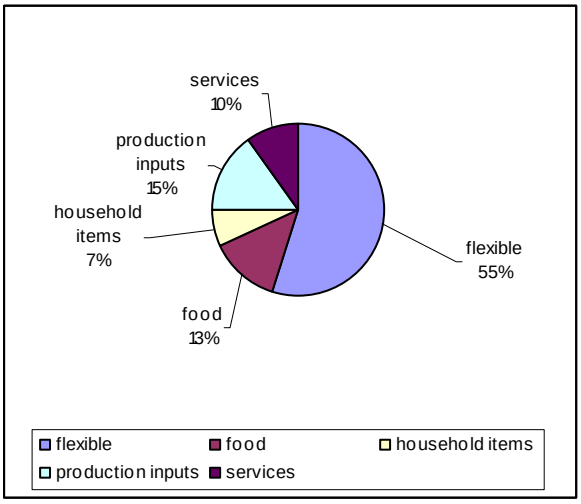


Figure 4: Expenditure distribution 'rich hh'



Comparative data for typical 'rich' and 'poor' households selected villages, Hambantota district, Sri Lanka

HEA analysis of expenditure distribution and 'income flexibility' (Figures 3 and 4) provided a more rigorous basis for assessing how changes in water expenditure are likely to affect the overall household economy. In the Sri Lankan case study most of this 'flexibility' consisted of rice or millet held in store, a practice which had enabled households in this area to maintain their food security during three successive drought years. Analysis of the relative importance of different food income sources (Figure 6) highlighted the importance of agricultural uses of water in this area and contrasted with many semi-arid areas of sub-Saharan Africa where livestock watering represents the single most important productive water use. A basic understanding of these linkages between water availability, access and use, and food security, provided key inputs into the development of the DST.

Figure 5: Example of Household Expenditure

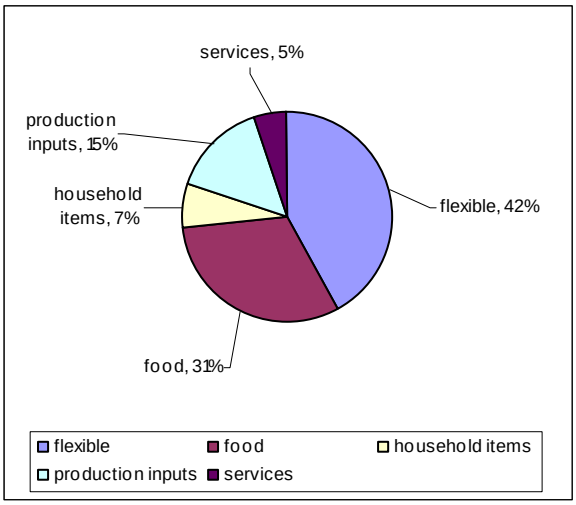
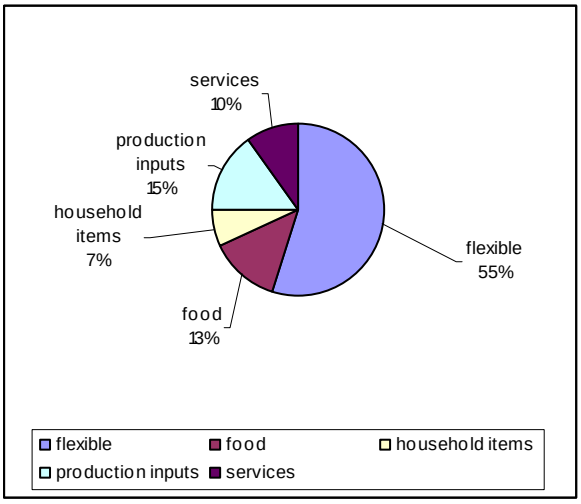


Figure 6: Household Income as Food



Descriptions of expenditure patterns in 'good', 'normal' and 'bad' years can indicate potential trade-offs for poor households as a result of, for example, increased water tariffs under a new DRA scheme. The impact of doubling the cost of water (or any other commodity) is rarely as straightforward as simply doubling expenditure. Depending on other household priorities and demands, this might result in cutting one type of expenditure completely or shaving a little from each category of expenditure ranging from health to other household items. Many of these basic expenditure categories are effectively 'inelastic'. Fieldwork suggested that in such circumstances categories such as girl children's education were often the 'first to go'. Understanding the elasticity of demand for water in relation to 'income elasticity and flexibility' is therefore particularly important for planning cost recovery across a range of basic services.

Where relevant, the data set could be expanded to show intra-annual variations in food, cash and labour, and be plotted against seasonal variations in water resource availability, access and use. This helped to highlight temporal patterns of vulnerability which then helped in assessing the impact of longer-term changes in the household water economy, either as a result of drought or the installation of new supply systems. Impacts could be demonstrated in terms of changes in household expenditure (labour or cash) required to access water and/or changes in household food and non-food income resulting from productive water use. Analysis could also be repeated for a series of years by household type in order to show interannual variations.

Even at the most basic level of analysis it was clear that periodic shocks such as droughts – which are common in Hambantota and other semi-arid areas – could have a substantial impact on the capacity of poor households to meet their basic food and non-food needs, with implications for capacity to sustain expenditure on water services. In practice multiple scenarios, based upon different policy assumptions, could therefore show a range of possible outcomes for a proposed water intervention, and a range of possible scenarios from a financial vulnerability perspective.

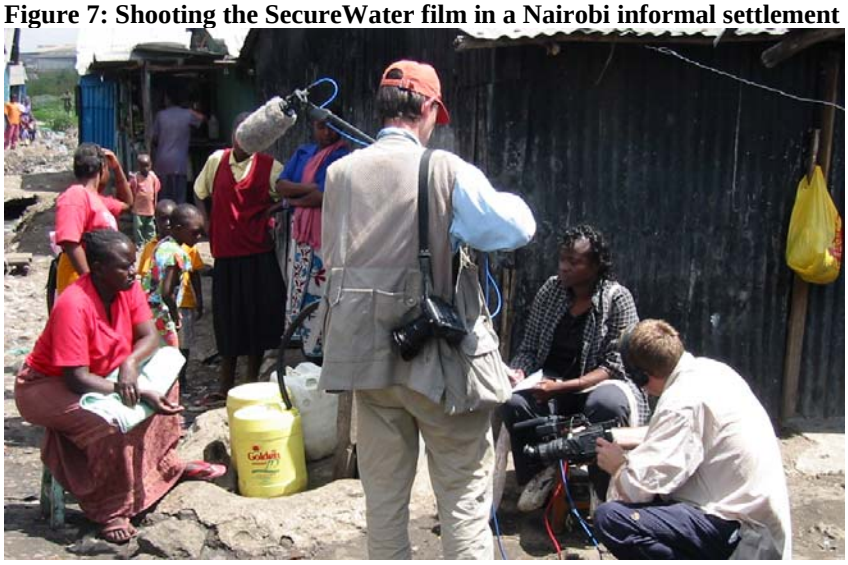
SecureWater assessment based on HEA and combining aspects of SL approaches and gender analysis therefore offered a logically consistent way of thinking through the complex and multiple linkages between water, poverty and livelihoods and formed the basis for subsequent in-depth case studies in Sri Lanka, India and Kenya.

Unfortunately a 12-month funding hiatus between the Inception phase and the Research phase affected project development. During this period efforts were made to maintain the project profile and initial international research and dissemination links established during the Inception period. This included production of a film entitled *SecureWater: water, livelihoods and demand-based approaches* and commissioning professional photographer Andy Johnstone (Panos Pictures) to document emerging

research issues. These activities were funded separately, including support from the DFID Sustainable Livelihoods Support Office (SLSO).

Shot on location in Kenya, India and Sri Lanka, the film illustrates on the one hand, the linkages between water, poverty and livelihoods, and on the other the challenges faced by interveners trying to establish socially and financially sustainable projects at a community level. It was produced by the ODI Water Policy Programme, in collaboration with Wild Dog Films Ltd, UK. In March 2003, in the run up to the 3rd World Water Forum in Japan, ODI WPP organised a film and photographic exhibition at the Oxo gallery on the London's Southbank, to mark the International Year of Freshwater. The film was subsequently screened as part of the ADB-funded Water and Poverty Initiative at the 3rd World Water Forum in Kyoto, Japan and the photographs were displayed in the 'atrium' at the UK Department for International Development.

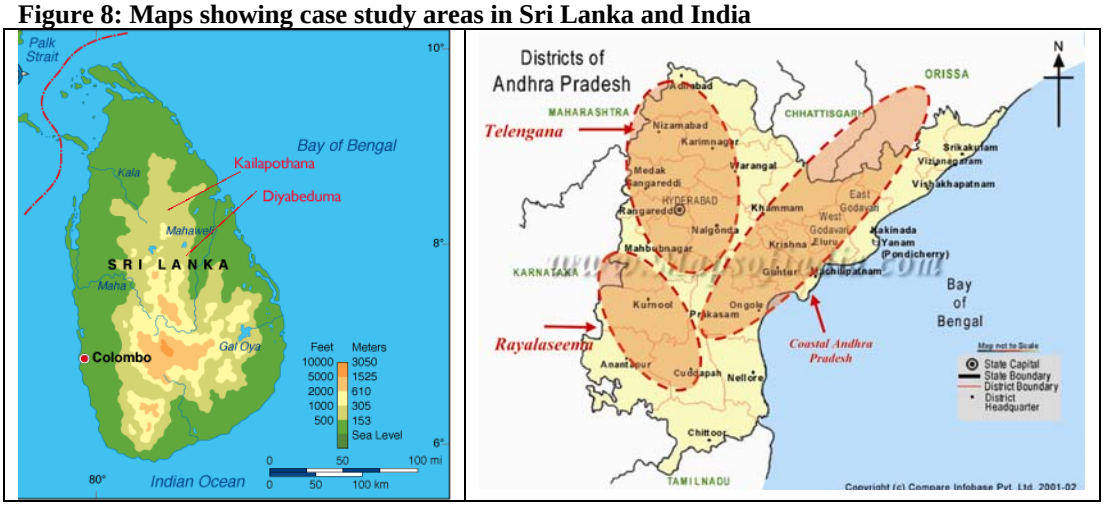
Figure 7: Shooting the SecureWater film in a Nairobi informal settlement



2.2 Research phase

The main research phase began in May 2003. Project activities were coordinated by ODI's WPP in London, with inputs and support from other UK-based institutions, including Intermediate Technology Development Group (ITDG), Save the Children UK and the British Geological Survey (BGS). In-depth case study research was undertaken in India and Sri Lanka. *SecureWater* activities in India were led by Dr Deepa Joshi (University of Southampton) and in Sri Lanka by Mr Rajindra Ariyabandu (Water Resources Secretariat, Colombo). A further linked study was conducted later in Nairobi, Kenya, led by the ITDG East Africa Office.

Figure 8: Maps showing case study areas in Sri Lanka and India



Sri Lanka

Rajindra Ariyabandu visited the UK in September 2003 to discuss emerging project findings. As the then Director of Policy and Planning at the Water Resources Secretariat (WRS) he was closely involved in the development of national water policy in Sri Lanka. He gave a series of presentations (ODI, DFID, BGS, WaterAid) outlining recent policy debates and the potential contribution of the *SecureWater* research. There has been a significant recent shift in Sri Lankan water policy towards the provision of water supplies through public-private-community partnerships with the National Water Supply and Drainage Board (NWSDB) functioning as a facilitator and regulator. The demand-responsive approach (DRA), piloted by the World Bank Community Water Supply and Sanitation Project (CWSSP) and subsequently adopted by ADB and other big donors is being 'rolled out' across Sri Lanka. The new policy implies significant changes in the roles and responsibilities of water sector stakeholders from government officials to beneficiary communities. *SecureWater* research involved tracing the evolution of policy in Sri Lanka, including how it is understood by decision makers and interpreted by practitioners.

Field research in Sri Lanka centred on two case study villages in the North Central dry zone: Diyabeduma in Polonnaruwa district, and Kailapathana in Anuradhapura district. Livelihood patterns in the two villages are broadly similar, i.e. predominantly dependent on irrigated agriculture, and both have recently been the subject of new water supply schemes following a 'demand-responsive approach' (DRA). Detailed field research was conducted[11] to examine the impact of recent changes in water access arrangements and the distribution of associated costs and benefits within each community. The research focused on how DRA implementation might be enhanced to ensure an appropriate balance between financial sustainability and poverty reduction objectives. This is a complex challenge and stakeholders interviewed at district, regional and national level expressed considerable interest in the outcomes of the research. The *SecureWater* case study aimed to inform both donor and government policy in the water sector in Sri Lanka.

Issues arising from the research were discussed at an initial national-level workshop in December 2003[12]. The workshop was unusual in bringing together such a wide range of different sectoral stakeholders (government, policy makers, researchers, NGOs and implementing agencies) and as such provided a valuable opportunity for constructive dialogue. The agenda was structured sequentially to address issues of policy, implementation, impacts and ways forward. The event was also filmed as part of the WRS public awareness campaign on water reform, and clips and short interviews used for documentaries on Sri Lankan TV. Workshop participants confirmed their interest in further involvement in the development and piloting of decision support tools.

India

The *SecureWater* project team was led by Deepa Joshi who has over 10 years experience working on water sector reform issues in India and holds a PhD from the University of Southampton. Research in India centred on the State of Andhra Pradesh (AP) and involved policy and institutional analysis at both national and state level and detailed fieldwork conducted in case study villages in the districts of Chittoor and Mahbubgnagar in AP.

The India case study began with analysis of the recent evolution of water sector policy in India, specifically the ongoing Sector Reform Programme (SRP), initiated by the Government of India (GoI) in 1999 and led by the Rajiv Ghandi Drinking Water Mission (RGDWM) in Delhi. The SRP was designed to bring about a major shift in policy away from previous government-driven, supply-led approaches towards the adoption of a Demand-Responsive Approach (DRA) to water supply development. It seeks to build on early experiences, notably from Swajal, and elaborate 'Swajaldhara' guidelines for the implementation of DRA in the Indian context. Sector reform processes have been supported by various external agencies including the South Asia Water & Sanitation Programme (WSP) with assistance from DFID-India.

[11] In collaboration with the Agricultural Research and Training Institute (ARTI), Colombo.
[12] See www.securewater.org for workshop report

SecureWater research has traced how these reforms are understood by decision-makers at different levels, how they are interpreted by practitioners and the resulting impacts on beneficiary communities. Two case study villages were selected. The first – Nattiobannigaripalle in Chittoor district – is an SRP village, the second – Vemula in Mahbubgnagar district – is not. In each case detailed research was conducted to understand the livelihood impact of changing water access arrangements and to identify ways in which DRA planning and implementation might be enhanced to better address poverty-livelihood dynamics, and thereby improve long-term sustainability in service delivery.

The research team also contributed to the DFID-funded BGS *ComMan* (Community Management of Groundwater) workshop in Delhi in January 2004[13] and discussions were held with DFID-India and WSP to discuss emerging issues, opportunities for follow-up and entry points through which *SecureWater* research could most usefully inform sector development processes. As part of its efforts to scale-up sector reforms nation-wide, GoI requested the development of State-level strategies for implementing reforms; 2004 was thus a watershed year for the development of 'State drinking water plans'. WSP supported this process in AP by conducting a review of experience to-date in SRP pilot districts and incorporating insights from the *SecureWater* research.

The India workshop, organised in consultation with WSP and timed to inform current policy development processes in AP, was held in Hyderabad in March 2004 and facilitated by the Andhra Pradesh Academy for Rural Development (APARD) which is the agency responsible for capacity building and training under the GoI SRP. It was attended by a wide range of sector stakeholders from AP (state government, researchers, donor agencies, private sector and NGOs), plus a number of key national level stakeholders from Delhi (RGDWM, WSP, DFID-India, UNICEF) including a Director of the Rajiv Gandhi Drinking Water Mission.

The workshop was the first time such a range of different stakeholders had come together in one place and resulted in some very frank and open discussions around the challenges associated with the sector reform process. It was also attended by Rajindra Ariyabandu who provided valuable comparative insights from the Sri Lankan context. There was particular interest among participants in building the lessons from *SecureWater* research into the development of State Drinking Water Plan. Furthermore there was a general consensus on the need to develop guidelines to assist practitioners in AP and elsewhere in thinking through these issues. *SecureWater* research was also presented at a national level workshop in Delhi to discuss DFID-funded research on water issues in India.

Kenya

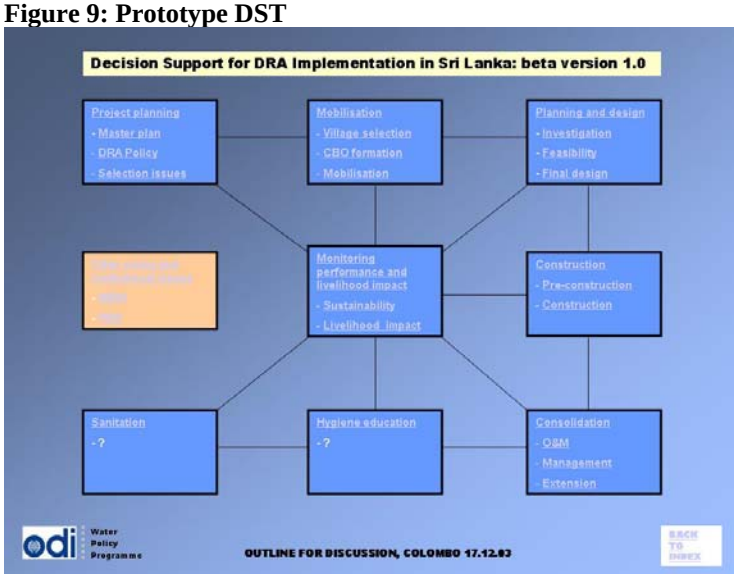
A third smaller case study was carried out in Nairobi, Kenya, in collaboration with ITDG East Africa. *SecureWater* research activities were conducted in conjunction with two other DFID-funded research projects on *Water Vendors*[14] and *Gender, Hygiene and Sanitation*[15]. The Kenya case study centres on informal settlements in Nairobi, thereby providing a valuable contrast to the rural case studies from India and Sri Lanka. It focuses in particular on the links between sanitation and urban livelihoods which remain under-researched and poorly understood. Research included a review of water sector reforms and the policy and institutional context relating to WSS in urban slum areas. During a three month secondment to the ITDG East Africa office in early 2004, ODI WPP team member Sophie Evitt assisted in developing and piloting the research methodology. Detailed fieldwork was subsequently completed in Maili Saba, one of Nairobi's largest informal settlements. Deepa Joshi visited ITDG East Africa at the end of 2004 to share lessons from research in India and assist Kenyan research partners with data analysis and report writing. Focus group discussions were organised to facilitate discussion of issues emerging among settlement dwellers. Research partners are currently engaged in further targeted dissemination of research findings to inform decision making among both government and donor agencies.

[13] Dr Alan Nicol also worked with *ComMan* as a social development and livelihoods specialist.
[14] KaR project on Small-Scale Independent Providers in the Water Sector (WEDC W4-20)
[15] KaR project on Gender Issues in Promotion of Hygiene & Sanitation in Urban Areas (R8028)

UK team

In parallel to the ongoing fieldwork in India, Sri Lanka and Kenya, UK-based project members began developing a prototype 'decision support tool' (DST) building on research findings emerging from country case studies. The DST concept was subsequently discussed and further elaborated at national level workshops in Sri Lanka and India. WSS sector stakeholders in both countries expressed considerable interest in the idea of developing decision-support tools to assist decision-making and implementation of DRA. The process of DST development is outlined in Section 4.

Figure 9: Prototype DST



3. Summary of research findings

3.1 India

Lack of secure access to sustainable water supplies remains a major obstacle to efforts at reducing poverty. The failure of previous supply-led approaches to realise the goal of 'water for all' has led to a global shift in water policies and the emergence of new 'Demand Responsive Approaches' (DRA). In principle, DRA aims to improve efficiency and therefore the financial and technical sustainability of delivery systems. In practice, this implies major changes in the roles and responsibilities of sector stakeholders. These principles as well as related principles of integrated water management, increasingly inform the development and implementation of water supply policies around the world, but their interpretation and the degree of their translation into practice varies substantially, both between and within countries. At the same time, there is growing consensus on the importance of poverty reduction as a central objective of both government and donor strategies. A key concern therefore is the extent to which sector reform objectives are consistent with wider objectives of poverty reduction and how linkages between the two can be enhanced.

SecureWater research has examined the interpretation, application and implementation of the DRA in water supply policy and practice. The central focus of the research is on the extent to which current interpretations of 'demand' are cognisant of the complex linkages between water, poverty and livelihoods. In-depth case study research in Andhra Pradesh provides critical insights into both conceptual and practical challenges associated with the implementation of DRA in the Indian context. The ultimate purpose of the research is to highlight ways in which current approaches might be enhanced to ensure appropriate balance between sustainability and poverty reduction objectives. The study combined interviews with key informants at national, state and district level and in-depth fieldwork in two rural communities. A range of different research methodologies was employed in order to examine the nature of household economy and water-dependent livelihood activities within

each community, and how this affected household and community *demand* for water. The combined methodology provided in-depth analysis of:

- The process of policy and institutional reform at national level;
- The process of policy and institutional reform in Andhra Pradesh and the way in which national and state level policy reforms were translated into practice;
- The nature and dynamics of water-poverty-livelihood linkages in two case study locations, the extent to which these have been addressed in current approaches and the implications for future design and implementation of DRA programmes.

In India, reviews – both external and internal – pointing out poor financial and operational management of technocratic supply-driven institutions and interventions influenced the sectoral shift towards the DRA, which mirrors the Government of India's (GoI) constitutional goal of decentralisation. The policy approach was officially piloted as the Sector Reform Programme in 67 districts across 26 states in 1999. Barely a year after the programme took off in the pilot districts, giving little time for their in-depth analysis, the Sector Reform Programme was scaled-up to a countrywide programme, called the Swajaldhara, by the former Prime Minister. The concerned department later declared the reform principles as 'non-negotiable', and those which 'supersede all earlier guidelines' (GoI, 2003). Swajaldhara involved:

- A demand-driven, integrated approach to rural water supply and sanitation;
- Partial (10%) capital cost recovery and 100% O&M financing by users;
- Community participation in project planning, implementation and maintenance;
- Stronger links to watershed development programmes;
- Control measures on over-extraction of groundwater.

Whilst significant as part of a major reform process across the sector, important concerns remain relating to the pace and sequencing of these reforms at different levels. Fragmentation of sub-sectors is already a major problem in India and the challenge of effecting institutional change cannot be underestimated. In the context of *SecureWater* research, the contribution of poverty reduction strategies to meeting sustainability objectives within the sector remain inadequately understood and poorly articulated in policy documents. In short, political imperatives have tended to override other concerns.

Having made the policy shift, the emphasis in India moved to a speedy transition from a supply-led to demand-led approach. However, experience of this move in pilot districts was variable. In the course of the research many sectoral stakeholders argued that attempts to scale-up may have been premature while others pointed out that the policy framework required sufficient breadth to allow individual states to adapt it to local context. Research also showed that haste in implementation and institutionalisation was of concern, especially as the Swajaldhara guidelines had no explicit poverty and equity focus. Highlighting poverty issues in policy is an imperative if poverty reduction is to be planned and designed in practice. However, *SecureWater* research showed how policy 'evaporates' as it gets handed down from global to local level institutions, and illustrated how the lack of such a focus serves to perpetuate rather than reduce the water poverty linkages.

Designed to deliver water by *demand* – identified as what users need and are able to afford – DRA in policy aims to provide a voice and choice for all (including the poorest whose interests are often neglected in water development interventions). However, several gaps were identified in the design of currently-implemented demand responsive approaches, including:

- A simplistic understanding of the term *community* – due primarily to broad assumptions made of users: their water-livelihood links, economic contexts and conflicting uses of and needs for water;
- A lack of clarity on the notion of *sustainability* linked to the dominant interpretation of demand in terms of user financing, and emphasis on community management of implemented schemes;

- Assumptions concerning *capacity* of local level institutions to assess and respond to demand resulting in the low priority accorded to capacity building, and failure to take account of political factors affecting policy and practice.

The findings revealed further broad disjunctions in water resource management policies and overlapping fragmentations of the water sector across a three-tiered (central, state and local) institutional framework.

The state of Andhra Pradesh was chosen for detailed case study analysis, given its history of drought and its progressive and reformist government. In Andhra Pradesh, development goals entail conflict between economic growth and equity, especially in the allocation and distribution of water among regions and sectors. This was partly resolved in the development of the State Water Vision but several challenges lie in its translation to practice – evidenced by the fact that the AP Water Vision did not influence the Sector Reform agenda of the domestic water sector. A key question was therefore how the national level sectoral reform agenda (emphasising efficiency and financial sustainability) accorded with and contributed to wider state level policy objectives such as pro-poor growth and poverty reduction.

The India research underscored the challenging nature of the institutional and policy environment in AP, noting that the rhetorical emphasis on policy coherence among activities in different sectors was not reflected in reality. Issues of institutional fragmentation and contradicting, competing uses of water remained unaddressed in the implementation of the SRP in AP at the time the research was conducted. The adoption of DRA-based sector reforms was arguably inconsistent with the prevailing target-driven approach. Consequently, local level implementation of the sector reform agenda tended to involve pushing forward the programme in a supply-driven mode without any real change in institutional attitudes and practices. Pressure from above and within the State to achieve targets combined with political interference led to a reported high incidence of malpractice. This was encouraged by the lack of clarity in the policy guidelines combined with inadequate incentives to adopt new practices of assessing and addressing 'demand'.

State governments in India currently enjoy a degree of discretion in defining sector policy and plans, but Swajaldhara guidelines are more comprehensive and prescriptive than in the SRP. The need to build institutional capacity around the process of understanding and responding to demand has generally been grossly underestimated. Part of the problem is that the process of reform, remains centrally driven by GoI which provides financial incentives to states to fall in line with national policy objectives, but is itself far removed from the reality of policy implementation.

Box 2: Case study research in Tanda and Nattiobannagaripalli

'I would have liked to take an individual connection. This would have made it easier for my wife to fetch water, especially as she is not well and it would be easier to fetch water for animals. Also I could have intensified kitchen gardening. But the money collection for this scheme took place at a time when it was just impossible for me to spare the amount. I don't know how I can take an individual connection now [the programme has no support scheme for latecomers]. A lot of water issues and activities affect us. But who listens to us? This also happened in the watershed programme. Because we don't have land, people assume we don't have any need for water.'

Source: Field research: Kotha Reddapa (2003)

In-depth case study analysis in two research locales in AP provided key insights into the complex nature of linkages between water, poverty and livelihoods, the extent to which these were addressed under existing approaches and implications for future design and implementation.

The sector reform agenda places huge emphasis on user communities to function as management and financing institutions. Field analyses contradicted the underlying assumptions of this agenda. First, water resources, both communal and individual, remained under the control of a small but – socially,

politically and economically – powerful elite which, given the gender and caste discrepancies in India, is made up of the upper caste males in village settings.

Secondly, not all households could afford to make an initial investment in improved drinking water services; the key beneficiaries were generally the economically better-off. Further, there was a lack of clarity in the definition of 'sustainability' (technical, financial, social, resource) evidenced *inter alia* by the lack of any effective mechanisms for regulating water use. Contrary to popular thinking, the DRA as practised tended to cross-subsidise the rich in much the same way as did the former supply-led approach.

The chances of achieving financial sustainability are higher if diverse needs and demands for water are taken into account. However, institutional fragmentation among water sub-sectors meant that, despite the policy rhetoric of responding to 'demand' for water in a holistic and integrated manner, the programme was narrowly focused on delivering drinking water only and failed to cater for productive uses by households. Finally, the research showed that links between improved water access and secure livelihoods could only be established when complementary natural and/or human assets were assured. Building from these insights, the following realities need to be taken into consideration in future development of DRA:

In practice

- The community is a heterogeneous entity; deciding who or what constitutes a real level of 'community demand' is subject to narrow sectional interests. As a result, the needs of the poorest usually fail to get articulated; building in a more complex and differentiated view of communities is an imperative;
- The strategy of cost recovery through community financing needs to take adequate account of how people's capacity to pay varies by household condition and situation (age, disability, death of key earning members); by season; by 'type' of years in vulnerable agricultural (and beyond agriculture) systems; and also by changes to the wider economic environment;
- Failing this, the potential dangers are financial 'crunches' that do not enable the meeting of realistic costs of sustaining systems and therefore, possibly, eventual scheme failure; early warning of potential 'crunches' and building them into financial management systems is critical;
- The distribution of water for different uses and among different users is highly specific to local situations and determined by geography and evolving economic and socio-political contexts; the most appropriate allocation of water among different uses and users cannot be pre-determined and solutions to conflict need to be localised; a clear picture of the water management arrangements, by source and by user group is essential;
- The impact of appropriately matching demand that represents the needs and views of the poor with clearly thought-through levels of financing contributed by households can to a large extent benefit household well-being by enabling more productive and sustainable livelihood strategies; levels of service, types of technologies and financing arrangement should all take account of domestic livelihoods (productive) usage as well as domestic reproductive uses.

In policy

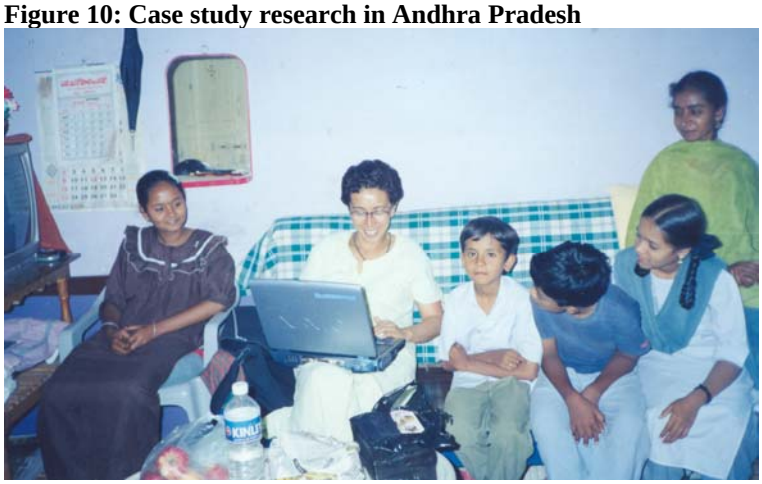
The DRA, by virtue of its goal to understand and address 'demand', holds great potential for addressing existing inequity in water access and use. However, *SecureWater* research in India showed that 'poverty' remained inadequately understood and poorly articulated in DRA policy documents. While the importance of access to WSS for poverty reduction is undoubtedly high, because the benefits are rarely examined in detail, their full potential is unlikely to be realised.

Beyond policy and practice

Translating policy effectively into practice requires a systematic process of internalisation of policy reform across institutional levels. As water sector institutions with historical perspectives of supply-led approaches struggle to assimilate DRA reforms, understanding of the context and situation-specific heterogeneity of poverty and its links to water access and control remains weak. Tools for 'doing' DRA need clear strategies and guidelines for analysing and addressing water-poverty-livelihood links

and agencies need time to understand and internalise these concerns. Otherwise, the interpretation of 'demand' will continue to be restricted to delivering water to those who can pay. Thus, despite the potential for a better poverty focus, there is a danger that the application of Demand Responsive Approaches in India will continue to exclude the poorest from access to appropriate water.

Figure 10: Case study research in Andhra Pradesh



3.2 Sri Lanka

Water supply to rural areas in Sri Lanka is a function and a responsibility of the Pradshiya Sabha (local authorities). Accelerated development in this area began in the early 1980s, although interventions were top-down, with participation of water users often limited to the construction stage. This began to change in 1991 with the first Community Water Supply and Sanitation Project (CWSSP). More user participation was evident in all stages of project implementation. Since then, many projects have been carried out in rural water supply, and demand responsive approaches (DRA) have been tried and tested in most of these, with the result that DRA has been accepted as the guiding principle for future rural water supply.

Sri Lanka is considered a country of abundant water resources, with an annual per capita water supply of 2,400cm. However, problems of water scarcity are common in many parts of the country as a result of spatial and temporal variations in rainfall and changing weather patterns. Currently, 84% of water is used for agriculture but improvements in socioeconomic and industrial development over the last two decades, coupled with rapid urbanisation, have increased demand for other competing uses. In response the government of Sri Lanka has increasingly delegated responsibility for water management, although attempts to legalise private sector participation in water services have been opposed by certain interested parties and environmental groups.

Sri Lanka expects to reach a target of water for all by 2025. It hopes that by promoting DRA as a tool to improve efficiency and sustainability and through using the private sector and Community Based Organisations (CBOs) it can target the poor more effectively. Implementation of DRA has improved since the first CWSSP. Through the water supply and sanitation projects under ADB III (Asian Development Bank, Rural Water Supply and Sanitation Project III), a process has been developed enabling user participation in water supply scheme management. Social mobilisation, village participatory planning, informed choice, and cost recovery have been some of the key elements introduced, and are expected to lead to improvements in system sustainability and livelihoods of the poor.

SecureWater research in Sri Lanka aimed to understand the relationship between water and livelihoods in poor communities through piloting the household economy approach (HEA) as a practical and an affordable tool for analysing rural livelihoods in relation to DRA in rural water supply projects. The study adopted a case study approach, based on wealth groups as a way of analysing the impact of DRA on rural livelihoods.

Two villages, Kailapathana and Diyabeduma in the dry zone of Sri Lanka, were selected as case study areas. In both villages, water supply and sanitation schemes were implemented using DRA by the rural water supply section of the National Water Supply and Drainage Board (NWSDB), the primary water supply authority in Sri Lanka. Rural communities in both villages suffered prior to the projects through lack of access to safe drinking water. Small-scale farming and wage labour were the dominant pattern of livelihoods. Although both villages were agricultural settlements, only a few rich people had small parcels of paddy lands; most owned a small parcel of higher land for settlement and upland cultivation. Although water was available, accessibility was a problem, with the poor having to spend two to three hours collecting water in certain cases, even more so in the dry season. Women, women-headed households, widows and children often suffered as the main water carriers. This affected the poor more than the rich in the village community: women had to face embarrassment, humiliation and health problems in fetching water over long periods, whilst children had to compete for limited water, especially in the dry season.

Box 3: Capital cost contribution as % of monthly income, Sri Lanka

Kailapathana

Wealth Group	Average Contribution	Range
High	12.65	9-18.95
Middle	30.30	22-58.69
Low	53.30	24.54-96

Diyabeduma

High	30.7	15-56.20
Middle	53.30	22.5-90.00
Low	86.7	56.3-120.00

Source: *SecureWater* Sri Lanka report

Research showed that the implementation of water supply projects improved accessibility, adequacy and quality of water, with significant welfare and livelihood impacts at household level. Opportunities for wage labour and small-scale livelihood options (brick-making) had enhanced monthly income for some by about Rs800-1000. Pipe-borne water in the two villages improved per capita water consumption about threefold among the poor; but the increase has been almost fivefold among the rich households. Time savings had a particular effect on wage labour, especially in the dry season, and particularly during the harvesting of paddy. Access to domestic water had improved sanitation for all community members, benefiting women and young girls in terms of security and privacy. The threefold appreciation in land value as a result of scheme implementation was a major indirect impact of the new piped water supplies.

Figure 11: Multiple sources of water in Sri Lanka

Existing village institutional arrangements were strengthened and community-based organisations formed to operate and manage the two water supply projects. The powers and functions of these CBOs, internalised by the organisation itself, instilled in the communities a sense of ownership of the rural infrastructure. The CBO structure was initially that of a voluntary organisation serving the community on a welfare basis. However, owing to increased membership and responsibility, both CBOs contemplated becoming non-profit 'people-based companies'. This would give them potential to be involved in other income generating ventures besides domestic water supply.

Although the majority benefited from the project, there were significant livelihood trade-offs in obtaining access to water. The impacts of trade-offs varied according to wealth category within the community. While minimal for the rich, the poor often had to forego consumption, family possessions and permanent assets to raise the initial cash contributions needed in order to obtain a connection. *SecureWater* research indicated that rich households used more water and had therefore benefited in terms of savings on transport costs and greater availability of water for small-scale productive uses; but the relative benefits in terms of food and non-food income had been greatest for the poorest households who relied most heavily on their own labour.

The Sri Lanka research indicated that, although good as a tool for assessing the demand of the majority, DRA failed to realise full coverage within a community and appeared to be biased towards cost recovery, thereby marginalising the poorer section of the community from mainstream access to domestic water. DRA was ineffective in identifying specific demands of sub-communities and individual households and was insufficiently flexible to take account of the seasonal nature of household income and variable financing capacity of the rural poor. Furthermore, the demand-responsive approach appeared inadequately sensitive to country-specific conditions. In Sri Lanka, domestic pipe-borne water has attached important 'social status' for households, which means communities often go for the 'best' rather than most appropriate technology option. *SecureWater* research suggested too that the technology option chosen depended not only on willingness to pay but also to a significant degree on past experience of similar projects and the credibility of the implementing agency. The concept of willingness to pay as a measure of 'demand' may therefore not always provide a real picture, given the external socioeconomic conditions and non-economic motivations of and within communities in choosing between different service levels.

In response to some of the inherent weaknesses of DRA, the NWSDB devised a system of subsidies that attempted to include some of the economic 'drop-outs' from mainstream water supply projects. However, this system too often excluded CBO members who were not able to access the domestic water supply in spite of having made initial labour and cash contributions as part of cost recovery. The CBOs internalised the concept of DRA to the extent that they impose a penalty for latecomers to the scheme.

Addressing the issue of economic drop-outs and inclusion of non-beneficiaries in mainstream water supply and sanitation projects therefore requires greater in-depth understanding of water and livelihoods among rural water supply and sanitation communities. One of the features highlighted by the research was the danger of deterioration in other traditional water sources within the community, such as tube wells caused by the breakdown in former management arrangements. This could serve to marginalise further the poorest, who are not part of the new schemes and then become deprived of their sole source of drinking water. Key findings of the study can be summarised as:

- Water security for the majority has increased as a result of the approach;
- Projects are financially more sustainable under stable community-based organisations;
- A significant proportion of the community is still deprived of a household water supply despite the adoption of DRA;
- The poor are marginalised at different stages of the process;
- The impacts of trade-offs and subsequent benefits in obtaining access to water supply are greatest for the poor;

- Opportunities exist to implement mixed technologies to improve overall water security;
- At least 20% of the community has to be further subsidised to widen access to DRA;
- Sustainability of traditional point sources has been threatened owing to wider access to pipe water systems.

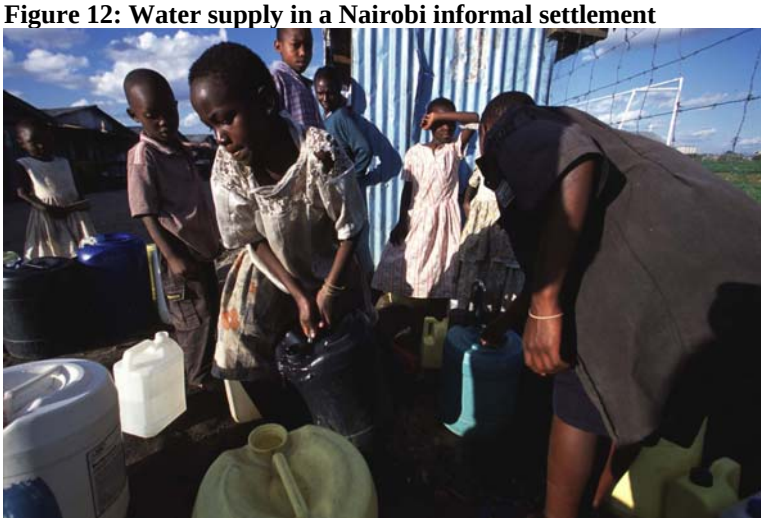
Whilst the *SecureWater* report limits its findings on water, livelihoods and poverty issues to two case studies, it is expected that the findings and follow-up 'decision support tools' will help to inform research and development under the next generation of DRA projects—ADB IV Rural Water Supply and Sanitation Project and the CWSSP II under the auspices of the World Bank. Enhanced knowledge of water, livelihoods and poverty within a larger sample of project sites will improve the effectiveness and sustainability of demand responsive approaches.

3.3 Kenya

Over the past two years, the water sector in Kenya has undergone rapid changes linked to the implementation of the Water Act 2002. One of the major changes has been the creation of new regulatory bodies which allow for protection of consumer rights, greater efficiency of service delivery, financial sustainability and pro-poor policies to protect low income consumers. The role of the central government has also started shifting from implementer to facilitator, with more responsibility given to communities, local authorities and other service providers.

However, although the water sector has received much attention from government, sanitation has lagged behind, despite the fact that it is one of the greatest problems facing Kenya's informal settlements where some 60% of people in urban areas reside. Many of the 50% of all preventable illnesses suffered in Kenya are within such settlements and related to poor water and sanitation. Responding to this situation, in 2000 the first official Sanitation and Health Policy was created following creation of the Environmental Sanitation and Hygiene Group encompassing most of the ministries linked to sanitation issues.

Figure 12: Water supply in a Nairobi informal settlement



At a broader level, Kenya's Poverty Reduction Strategy Paper (PRSP) recognizes the links between poverty and a lack of access to water and adequate sanitation a highlights the particular role of women in the provision, management and safeguarding of water and sanitation services. This has also fed into policy debates in the water and sanitation sectors.

Overall, space has opened up in the policy environment for greater community control and recognition of women's particular responsibilities and needs. However, in order to make a real difference to the lives of poor women and men in informal settlements, there is a need for improved understanding of the following issues:

- What 'appropriate sanitation' means for poor women and men?;
- How sanitation and water provision are linked to livelihoods (the set of 'capabilities, assets and activities required for a means of living');
- How access to sanitation and water varies by gender and across wealth groups within informal settlements, and how different choices in the provision of services might affect their access.

These questions were explored in detail in the Maili Saba informal settlement of Nairobi, using a combination of quantitative and qualitative research techniques. This area is home to a combination of owners and tenants (although the land is publicly owned), all with very poor access to water and sanitation. Linked studies were also conducted in two community sanitation blocks in two other informal settlements (Kibera and Kianda), to assess the extent to which they could be a solution to meeting the needs of the poor.

Figure 13: Water, sanitation and poverty indicators in Maili Saba

Wealth indicators	Poorest of the poor	Medium poor	Better off poor
Water	Hard to get adequate water, quality not assured	Hard to get quality water, quality not an issue	Able to afford water, quality still questionable
Sanitation	Few baths to control costs, shares toilets, uses shack bathroom	Can meet basic needs, some own sanitation facilities and some share	Able to afford, most own toilets and bathrooms, some share
House type	1-2 rooms, dirty, mud walls, iron sheet roof, earthen floor, rented	Like the poorest with plastered walls, cement floor, some owner occupiers	Owner occupiers, some block walled, cement floor, clean, iron sheet roof
Income generating activities	Mainly ballast making, some sell illicit brews and significant casual working	Mainly hawking e.g. second hand clothes, shoes and riverside farming	Small retail shops, sells vegetables, water vendors, landlords
Income	Earns between Ksh 80-100 daily, income very much irregular	Earns less than Ksh 150/day average, also irregular	Earns irregularly about Ksh 200. Daily retails business less than Ksh 2000 (gross)
Clothing	Dirty and smelly, torn, mainly 2nd hand, less often washed	Relatively clean 2nd hand clothes, not as torn as poorest.	Run small retail shops, vegetable grocers and industrial labourers.
Family size and education	Large family, 8-12 children, primary level education likely to become chokoras.	Less children than the poorest, some have access to school, several drop out	Have relatively fewer children (1-5), majority have access to education
Household assets	Some have no bed, own chairs and stools and poor quality cooking utensils	Some chairs, stools, ballast making tools, tables of better quality than poorest	Most own plots, houses, radio, sofa sets, animals, good beds, tables and chairs.

Source: *SecureWater* Kenya report

Major research findings can be summarised as follows:

- 'Appropriate sanitation' meant more than just latrines or toilets. Whilst including them, it also extended to washing (having a safe, private place and sufficient clean water); cleaning of clothes and keeping homes, latrines and bathrooms clean; and better drainage to avoid dirty water remaining in the streets;
- Water is an integral part of peoples' understanding of 'appropriate sanitation' because of its importance for washing and cleanliness, and because of the problems of poor drainage;
- Women were particularly concerned about the safety and cleanliness of facilities for themselves and their children. Both women and men prioritized convenience in terms of the distance to the latrine, and time spent queuing to use it;
- Residents in informal settlements are not uniformly poor. Three groups were identified: the 'very poor', 'medium poor' and 'better-off poor'. The varying levels and regularity of incomes of these groups is a key factor determining their access to sanitation and water;
- The 'very poor' were less likely to have access to their own latrine, and were likely to have to take responsibility for cleaning a shared one in return for being allowed to use it. They got more water from the cheapest, poorest quality sources, and the quantity of water they could afford fell dramatically during times of shortage;

- All residents suffered health problems as a result of the poor drainage and overflowing pit latrines common to Maili Saba. Water quality could be bad even for those who bought most of their water from piped sources (water kiosks);
- Links between water and livelihoods were clearer because water is an important input to some enterprises (in particular water vendors, construction, brewing, food-selling etc.). Sanitation and livelihoods tended to be indirectly linked through the impacts of poor facilities on health and time;
- Community sanitation blocks proved highly popular and successful. They made a noticeable difference to the local environment, and provided an income for the community groups that ran them. They also had multiple uses;
- Despite the participatory design process, there were still some ways in which they did not fully meet the needs of users. Women and children used them less than men. This was partly because of design features, and because women still needed pit latrines and bathrooms close to home for use after dark.

Key recommendations arising from the research include:

- In the context of piecemeal and unsystematic provision of sanitation and water services, there is a need for greater co-ordination. Lessons, best practices and resources need to be pooled so that solutions can be taken beyond the scale of demonstrations;
- Any intervention must try to increase, rather than decrease, the options available to people for accessing sanitation and water, which is especially important for women and the very-poor;
- Plans for sanitation and water services need to take livelihood and gender issues into account. They need to recognize that 'appropriate sanitation' which meets the needs of residents goes beyond toilet facilities. Participatory design will be critical to achieving this broader vision, but is also an iterative process where communities need to learn from each other to continuously improve the available options;
- Land tenure has been a significant stumbling block. Regularising land ownership, or at least allowing certain types of water and sanitation systems in informal settlements could make improvements possible for hundreds of thousands of people;
- Water vendors are the main suppliers of water to informal settlements. Policies need to work with them, recognizing their role and enabling them to provide a better supply to customers.

4. Dissemination and uptake

4.1 Dissemination strategy and impact

The *SecureWater* website remains the principal locus for dissemination of project outputs. The dissemination and uptake strategy has combined various parallel activities targeted at different levels ranging from international policy makers to practitioners on the ground.

A key concern, especially in the early stages, has been promoting intra-project learning. The Inception phase brought together research partners from five countries (India, Kenya, Malawi, Sri Lanka, Sudan) and a range of international agencies interested in policy and practice issues surrounding development and implementation of DRA (BGS, DFID, Environmental Economics UK, ITDG, ODI WPP, Save the Children UK, University of Southampton). The strategy of holding the Inception workshop in Nairobi enabled us to engage key regional level policy players at an early stage (Network for Water & Sanitation International (NETWAS) and World Bank Water and Sanitation Program – Africa), and to expose South Asian partners to issues and debates in sub-Saharan Africa, including a field trip to urban informal settlements.

Dissemination of research output has been ongoing since the beginning of the project. By hosting a side event at the Bonn International Freshwater Conference in December 2001 we were able to provide a platform for field researchers to present their ideas and concerns to an international audience

thereby exposing them to high level policy debates while simultaneously raising the profile of the project. The event was well attended (including DFID and WSP discussants, chaired by Jon Lane) and drew useful comments and constructive feedback. It also provided a better understanding of the needs and priorities of different target audiences and enabled compilation of an extensive distribution list.

The methods and tools workshop was held in Sri Lanka in order to test methodologies developed in sub-Saharan Africa in a South Asian setting, and encourage cross-learning between the two research communities. The workshop combined in-depth fieldwork in case study villages with interviews at district and national level and culminated in a presentation to the International Water Management Institute (IWMI) in Colombo. During the main research phase the project encouraged a more decentralised approach to intra-project learning with regular informal contact between case study countries on research progress. In addition to international dissemination networks established from the UK, partners were encouraged to develop national and sub-national networks in case study countries.

In Sri Lanka the *SecureWater* research team was drawn from the Water Resource Secretariat (WRS), and Agrarian Research and Training Institute (ARTI). Initial consultations in Colombo on the research and its relevance for water sector reform processes resulted in strong support and 'buy in' to project objectives from key stakeholder institutions. Subsequent regular briefings and updates as the project progressed enabled the team to establish a close working relationship with the National Water Supply & Drainage Board (NWSDB), World Bank Water Supply and Sanitation Project (CWSSP) as well as ADB consultants and NGOs involved in WSS development projects. The fieldwork itself was conducted in collaboration with local authorities and Community-Based Organisations who assisted with wealth ranking exercises and data collection. The results were presented to the communities for feedback prior to presentation and publication at national level. Issues arising from the research were discussed at a national level workshop in December 2003, and a core group of stakeholders identified to participate in development of *SecureWater* decision support tools to assist decision making and implementation of DRA in Sri Lanka. NWSDB expressed particular interest in using the findings of the *SecureWater* project to develop national guidelines for targeting those excluded under current approaches. A series of six small workshops were subsequently held to exchange information and document best practice via a web-based interactive decision support tool (see below).

In India the *SecureWater* case study involved simultaneous research activities at national, state, district and village levels. Consultations with key stakeholder institutions in Delhi generated interest in collaboration from the Water and Sanitation Program (WSP) South Asia, the Rajiv Gandhi Drinking Water Mission, UNICEF, and DFID. The India workshop, organised in consultation with WSP and timed to inform current policy development processes in AP, was held in Hyderabad in March 2004 and facilitated by the Andhra Pradesh Academy for Rural Development (APARD) which was the agency responsible for capacity building and training under the GoI SRP. It was attended by a wide range of sector stakeholders from AP (state government, researchers, donor agencies, private sector and NGOs), plus a number of key national level stakeholders from Delhi (RGDWM, WSP, DFID-India, UNICEF) including a Director of the Rajiv Gandhi Drinking Water Mission. The *SecureWater* team continued to work closely with APARD staff during subsequent development of the DST and organisation of the final project workshop.

The India study involved in-depth participatory research in the case study villages and close association with the Chittoor district Water and Sanitation Committee who provided invaluable assistance. Following completion of the research the team arranged a screening of the *SecureWater* film in the village of Nattiobanigaripalle where it was shot and facilitated a discussion between villagers and local officials. Staff from the Chittoor Water and Sanitation Committee have subsequently been actively involved in the development of the India section of the DST and the district collector of Cuddapah has agreed to pilot use of the materials. The final project workshops in Delhi, Hyderabad and Cuddapah were attended by both Sri Lankan research partners and NWSDB representatives interested to exchange experiences with their Indian government counterparts.

In Kenya case study findings are being disseminated via the Waste Secretariat, a Nairobi-based consortium of NGOs and UN agencies concerned with urban issues. Research findings from all three KAR projects were synthesised in a policy briefing entitled 'Livelihoods and Gender in Sanitation Hygiene and Water Services Among the Urban Poor'. This forms part of a series of Field Updates on Environmental Sanitation, targeted at policy makers and practitioners in the region.

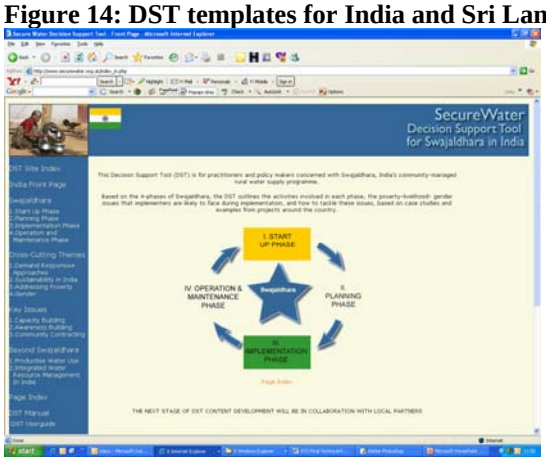
4.2 Development of decision support tool

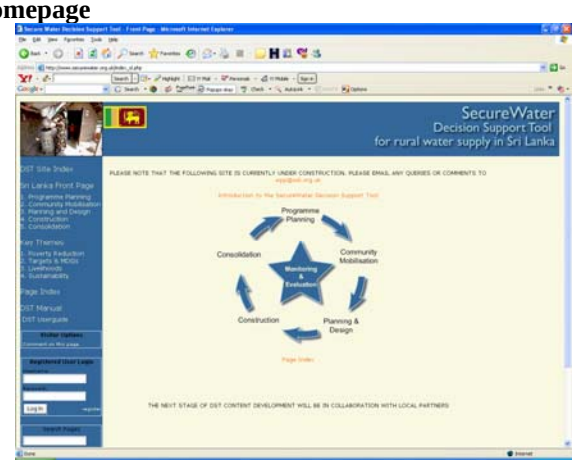
In parallel to the country case study research UK-based partners began developing a prototype 'decision support tool' (DST). The concept of decision support was initially discussed at the Sri Lanka national workshop. The common perception of DSTs is of data- or model-driven computer programmes where data is inputted and a solution derived. There are many examples but they are notoriously difficult to apply in real world decision making processes due to their inherent inflexibility. Instead we are interested in a new generation of knowledge or document-driven DSTs. These are not the kind of systems that give you an answer but rather help you come to an answer by drawing on existing information and experience from elsewhere.

A key objective of the *SecureWater* project has been to support decision-making processes at different levels by highlighting issues and challenges and identifying possible approaches to dealing with them. It was agreed that such a DST would need to be relatively simple and user-friendly. It would also probably need to be html-based allowing use of multi-media, rich in worked case study examples, 'data-lite', and flexible and adaptable rather than prescriptive. While the main focus should be on DRA planning and implementation processes the DST should be understandable (and potentially useful) at all levels. As such it needed to be developed iteratively and piloted and tested by end-users at an early stage.

A prototype *SecureWater* DST was subsequently developed[16] and presented to research partners for discussion following the national workshops. The emerging DST has been designed specifically to enable participatory content development and virtual networking among researchers and practitioners. It makes use of Linux-based 'wiki' software which has been used for numerous web-based applications designed to facilitate information exchange among specific user communities[17]. Once the basic functions were established the tool was demonstrated and tested during a series of small workshops in Sri Lanka and India. Various features have subsequently been modified on the basis of feedback to maximise usability and accessibility for developing country partners. An important additional function is the ability to create simpler CD versions to allow offline working and extension to users without internet access.

Figure 14: DST templates for India and Sri Lanka homepage





[16] Software development and technical support provided by *Terrainview*
[17] One of the best known existing applications is the *Wikipedia* (http://www.wikipedia.org)

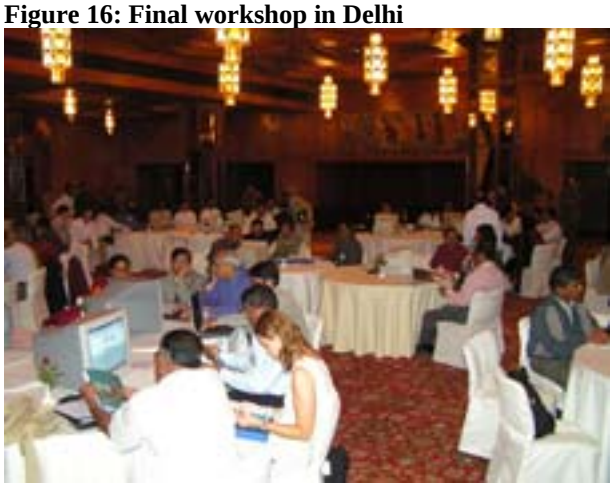
The DST is web-based to maximise user-participation in content development and allow simultaneous uploading from different countries. Editing rights were initially restricted to the immediate project team but have been extended to other users interested in contributing additional content. Separate templates have been used to distinguish India- and Sri Lanka- specific material but the entire site is searchable to promote learning across countries. The DST builds directly upon the findings of the *SecureWater* research. It has been developed in collaboration with stakeholders through discussion of key issues arising and identification and documentation of best practice approaches to addressing them. The design allows for continuous addition of new material and it is intended that the DST should continue to evolve beyond the end of the project. ODI is currently in the process of handing over responsibility for site management to in-country partners. The *SecureWater* DST is currently hosted at www.securewater.org.uk.

Figure 15: DST Editing

4.3 Final workshop

The final project workshop was held in India with consecutive workshops at National, State and District levels. The main purpose was to disseminate our research findings to policy makers and practitioners involved in implementing DRA in India, and encourage uptake of the DST at different levels. Each workshop involved presentations from ODI WPP and our research partners from India and Sri Lanka followed by demonstration of the DST. Participants were invited to provide critical feedback on the DST and encouraged to contribute to its future development. The main Delhi workshop was held in collaboration with UNICEF India as part of their annual donor conference and attended by senior UNICEF WSS officials. A second workshop was held at state level in Hyderabad and a third with district level officials in Cuddapa where the India case study was conducted. The workshops were successful in securing 'buy-in' from key agencies operating at different levels. There is considerable interest in both using and contributing to the existing DST. In particular the Water and Environmental Sanitation Network (WESNET) will use the DST as a platform for networking and information exchange and has agreed to take over responsibility for future development in India. This includes adaptation and expansion of the *SecureWater* DST for use in Uttaranchal, Gujarat and Kerala, facilitated by the IRC International Water and Sanitation Centre Resource Centre Programme.

Figure 16: Final workshop in Delhi



4.3 International activities

In addition to activities within and between case study countries the *SecureWater* team has been actively involved in dissemination via the following international fora:

1. **International Conferences**. *SecureWater* organised a dedicated side event at the International Conference on Freshwater in Bonn, December 2001 and produced a poster display for the ODI WPP booth at the World Summit on Sustainable Development in Johannesburg, September 2002. The *SecureWater* film was presented as part of the ADB-funded Water and Poverty Initiative at the 3rd World Water Forum in Kyoto, March 2003. Research findings were presented by partners from India and Sri Lanka an ODI seminar on 'Water, Poverty and Social Exclusion' as part of an ESRC-funded seminar series entitled 'Water Governance Challenging the Consensus', March 2005. Project outputs were presented and disseminated at the World Bank Water Week, Washington, March 2005.

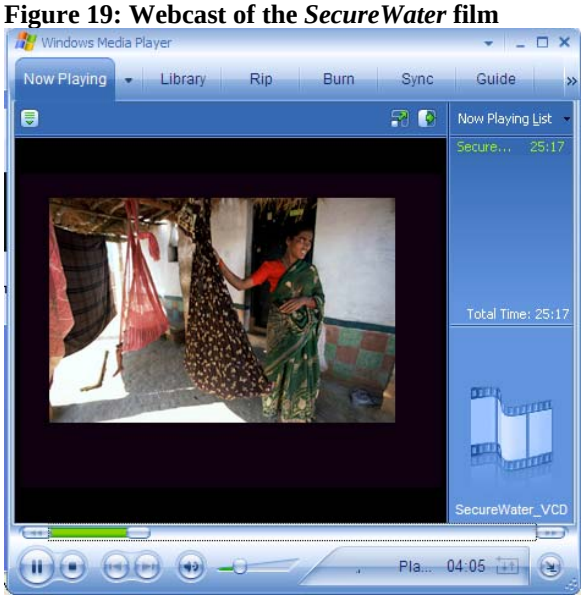
Figure 17: International Conferences

2. **International Research Networks**: *SecureWater* established strong links to other DFID-funded KAR projects including discussions with WHIRL via active membership of the Thematic Group on Productive Uses of Water at Household Level, hosted by the International Water and Sanitation Centre in Delft. The Kenya case study in Nairobi involved close collaboration with University of Southampton Gender & Sanitation project and the WEDC project on Water Vendors. The India team provided inputs to the DFID-funded *ComMan* project workshop on 'Community-based management of groundwater in India', Delhi, January 2004. The UK team presented research findings at a workshop on 'Improving Rural Water Management in India: policy issues from DFID research projects', Cambridge, January 2005.

Figure 18: Film and photographic exhibition

3. **International Media**: The team organised and hosted a Film and Photographic Exhibition in March 2003 at the Oxo Gallery, Southbank, London, marking the UN International Year of Freshwater. The exhibition, which ran for two weeks in the run up to the World Water Forum in Japan, was designed to raise public awareness of issues and challenges facing poor people in securing access to water in Africa and Asia. The exhibition received media coverage and was well attended with extremely positive feedback, including from local schools and community groups which used it for educational purposes. The photographs were subsequently displayed in the 'atrium' at the UK Department for International Development. In April 2004, the *SecureWater* film was selected by the UN for screening as part of an issue-based webcast on water supply, sanitation and human settlements during the Commission on Sustainable Development (CSD 12) meeting in New York (www.developmentvoices.net).

Figure 19: Webcast of the *SecureWater* film



Annexes

CD 1: SecureWater Decision Support Tool

CD 2: SecureWater Film

CD 3: SecureWater Reports