

An Introduction to Self Supply: Putting the User First

Incremental improvements and private investment in rural water supply

Self Supply encourages the incremental improvement of household and community supply through user investment in water treatment, supply construction and up-grading, including small rainwater harvesting and groundwater systems. It is a concept which complements conventional rural water supply funded by government, enabling self-help improvement of supplies where no protected supply is available, or where consumers feel they can support higher levels of service than are presently provided by the public sector.



Background

The Sub-Sahara African Context

The water and sanitation MDG targets in Africa can only be reached by progress in rural areas. However this is where progress is the most difficult. Across Africa, rural households lag well below urban ones in coverage and quality of water services. The poorest and most remote communities are typically by-passed by sector programs and carry less political weight. Decentralization has brought government closer to them, but local authorities have been handicapped by lack of adequate technical and financial support.

The UNDP Human Development Report 2006¹ estimates that, under current trends, Sub-Saharan Africa will only reach the MDG Water Target in 2040. That would still leave about 400 million of its people without access to safe water, the bulk of them living in

rural areas. There is need to reduce the time in which the target is reached (increased rate of progress and greater sustainability), and to avoid leaving the neglected four hundred million with no opportunity to improve their supply. This would impact not just on the water supply target, but on most of the main MDG objectives such as poverty reduction and child mortality.

Despite the promise of increased investment and better coordination, progress in rural water supply, at less than 1 percent increased coverage a year², remains constrained by policy and capacity gaps in public and private sectors, resulting in lagging implementation, often low sustainability and 30 million more rural people without access to safe water than in 1990.

Aims of RWSN

The RWSN Accra Forum³ focused on the need to broaden the response to these gaps and constraints by finding ways to build on household

initiatives and by opening expanded opportunities for the local private sector in the provision of water facilities and services.

The overall goal of RWSN is to lower costs, and improve sustainability of rural water supplies in Sub-Saharan Africa to help achieve the MDGs. This goal is further divided into four inter-linking themes, known as flagships with the following aims within Sub-Saharan Africa:

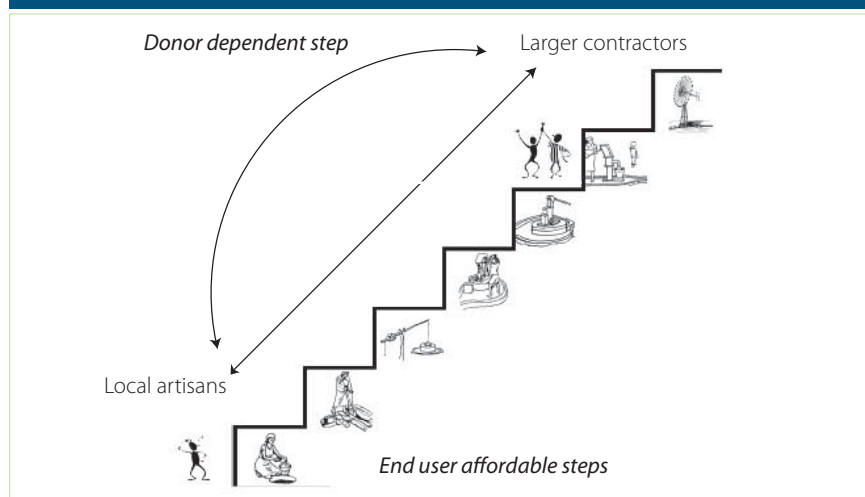
- Self Supply – private investment and household initiative are incorporated into national and international strategies for rural water supply improvement
- Cost-effective boreholes (CEB) – policies are adopted and practices are followed which bring about cost-effective borehole provision
- Sustainable water supplies (SWS) – rural households obtain highly-valued community water supply services which they are capable of sustaining indefinitely
- Handpump technologies (HT) – good quality production of handpumps, is ensured along with appropriate selection, procurement and simplified maintenance

What is Self Supply?ⁱ

Self Supply is the improvement to household or community water supply through user investment in water treatment, supply construction and up-grading, and rainwater harvesting. It is based on incremental improvements in steps which are easily replicable, with technologies affordable to users. This self-help approach is complementary

ⁱ For more details see the RWSN Self Supply Site www.rsw.n.ch

Figure 1. Water Supply Ladder Well up-grading



to conventional communal supply, which is generally government-funded and which forms the backbone of rural water supply. However the latter is not equally sustainable everywhere, and is inadequately funded to reach MDG target coverage in Sub-Saharan Africa.

Self Supply at household or community level generally implies strong ownership but also a sharing of the supply with those households nearby, often at no charge, offering effectively a privately managed communal service. All of the 'unserved' population use Self Supply, as do an unknown proportion of those regarded as served.

Steps such as those in the diagram (see Figure 1) encourage owners to aspire to further improvements to supply in the same way as they implement progressive improvements to their houses, building on what they have already done, copying ideas from neighbours and from what they see in urban and peri-urban areas. This creates a marketing dynamic found throughout the commercial world and exemplified by mobile phones (see Box 1), encouraging the fundamental urge to better oneself and ones family through providing an environment within which such changes are made easier. However, certain factors are significantly limiting their ability to make such changes.

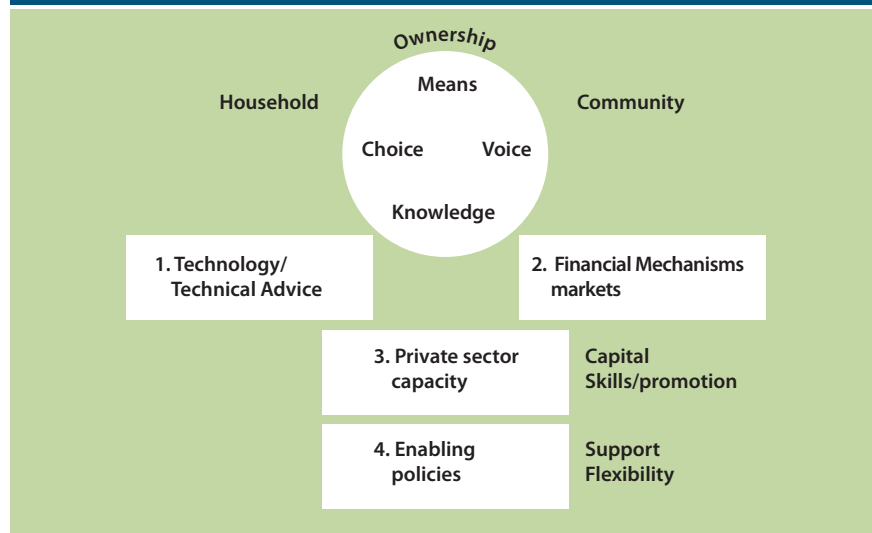
Supporting Self Supply without killing it

Self Supply requires donor financial support chiefly to implement a package of four building blocks (see Figure 2) which create a more enabling and sustainable environment, rather than providing specific hardware. The

Box 1. What can the growth in the mobile phone market teach us about marketing rural water supply?

- Creating a ladder of demand makes higher levels of service more available through private investment than a single option can.
- Reducing threshold costs means more people can access the first rung of the ladder.
- People are finding ways of accessing funds for a commodity they really regard as a priority and from which they gain obvious social and financial benefit.
- Those unable to purchase their own, arrange access to others with or without charge.
- Network coverage is not universal (coverage is 80 percent of world population). Mobile phones and fixed lines form complementary services in a similar way as may communal and private water supplies.

Figure 2. Building blocks of an Enabling Environment



environment so established is of equal relevance to sanitation and community water supply, and raises the profile and market potential of water supply and sanitation for local artisans and entrepreneurs. The four building blocks (see Figure 2) of (1) technology options/ advice, (2) financial mechanisms/ markets, (3) private sector capacity and (4) enabling policies, form a package which supports development of private ownership and enables rural populations to know about options

and their costs and advantages. It also offers the means to make improvements through micro-finance, traditional savings schemes and possibly also subsidies, and to choose technical options which suit them best, supporting their efforts without threatening their ownership and initiative. These blocks have been identified through discussions with those seeking to improve their own supplies, some of whom encountered major constraints, and others who

have succeeded in improvements up to levels of small mechanized piped supplies.

Promotion of private initiatives in water need to be through social marketing in similar way to total sanitation, using both the private sector marketing its products and skills, and the public sector health, water and agricultural extension services providing advice and monitoring progress. Effective marketing becomes essential when significant investment in water or sanitation has to compete with all the other calls on the household budget.

Why consider Self Supply?

1. Self Supply is a worldwide phenomenon (see Box 2), in that people who are able to, respond to the inadequacies of what the public sector can offerⁱⁱ. Such private investment also reflects the wish to use water for multiple purposes both productive and domestic⁴, which is usually difficult from communal supplies.
2. Supply inadequacies are at present especially to be found in:
 - (a) small communities (say of less than 200 people)
 - (b) communities with widely scattered households
 - (c) communities with weak and/or fragmented management

ⁱⁱ As DANIDA found in Bangladesh in 1998, "When services are affordable and delivered in a cost-effective manner the benefits become very significant and will in most cases provide an increased demand from the households for services which can be made available by the private sector. Through this mechanism there is a strong relationship between cheap and affordable services, private sector development and the likelihood of services to become sustainable". Evaluation of Rural Water Supply and Sanitation Programme Bangladesh

- (d) remote areas where access to maintenance services and spares is difficult
- (e) areas where potable ground and surface water are lacking
- (f) zones within larger communities which are peripheral to communal supplies and with closer access to household ones
- (g) households which cannot afford to pay water tariffs
- (h) water quality for more than 40 percent of households⁵ carrying water from the source which is contaminated during transport and/or storage

As coverage rises, the remaining communities and households are more likely to belong to these categories, as the more accessible, larger, stronger communities tend to have been the first to be covered. Thus, in addition, more flexible strategies may be necessary to increase coverage levels, and certainly to reach universal coverage.

Box 2. Self Supply around the world

- Over 14.5 million people in the US (22 percent of rural population), have their own private household supply (American Wellowners Association 2007).
- About a third of Indonesian rural water supply is said to be Self Supply (Source WSP Indonesia), and it is common throughout Asia and Latin America.
- Vietnam, Quang Nam province. Almost every house had its own well with an electric pump or a shared one with 2-3 other households, being used for water-based businesses (Noel S, Soussan J, Thao NP (2006) Productive use of water, a household level study from Vietnam, WEDC 32nd conference proceedings).
- Nicaragua Rope pumps financed by well owners have contributed 85 percent of increase in rural water coverage (now at 54.8 percent) since 1995 (Alberts J and van der Zee 2003, WCAInfonet).
- About 600,000 households in UK still have their own supplies and all rural areas in Europe have historically had a mix of private and public supply, shifting from private to public as networks extend.

Figure 3. Zimbabwe Up-graded Family well



(Photo: Peter Morgan)

What does Self Supply look like on the ground?

Self Supply has developed naturally as people have responded to their need for improved water supply, but is much constrained by lack of awareness of what can be achieved, inadequate private sector and government advice and services, unaffordable technologies and financial limitations. However there are already some instances of government supporting private initiatives in the region, to increase coverage rapidly and at large scale, particularly in Zimbabwe and Ethiopia.

Government-supported Self Supply – Zimbabwe

As a result of piloting by the Blair Institute and Ministry of Health in the early 1990's, Ministry for Water Development recognise the strategy and its contribution to MDGs and so supported family well up-grading⁶. Originally subsidised to a small (<20 percent) extent, the overall cost of \$200-300 was chiefly borne by well-owners. By 2006 over 120,000 family wells had been up-graded, serving more than 1.5 million people at minimal subsidy by donors or the state (\$3-5 per head). Many new families have dug wells on seeing the standards and convenience which could be achieved, or on finding that wells were possible in areas with no previous history of them, almost doubling the number in use. In addition they can make some \$75 per annum from irrigation of a 0.03 ha plot, or up to 8 times as much with a low cost pump, re-paying investment in less than a year.

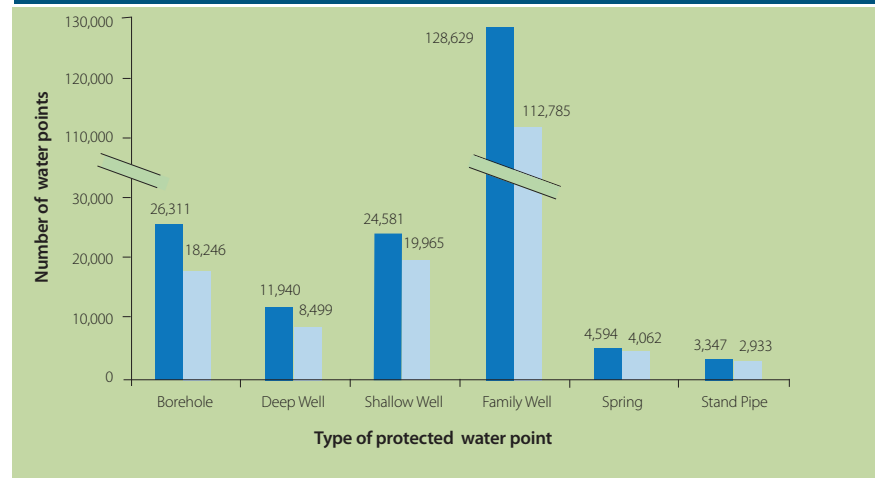
Family wells constitute over 50 percent of functioning rural water points, with 89 percent of functioning⁷, compared with 76 percent of communal supplies.

Government-supported Self Supply – Ethiopia

In 2005 the Ethiopian Government began to promote private construction

of wells to provide convenient access to water, often in areas with little or no previous history of well-digging. Many have been constructed and more people are copying their neighbours' efforts each year. There is enormous potential to improve these wells and apparent demand to do so. Depending on the up-take of household water treatment and the quality of water from sealed wells with rope pumps

Figure 4. Total number of protected water points in Zimbabwe by type
(Rural coverage in Zimbabwe - the large contribution of sustainable family wells.)



(Source: WASH Inventory map of Zimbabwe March)

Figure 5. Sealed family well with new rope pump, Oromia Region



(Photo: Sally Sutton)

Figure 6. Privately owned community supply in Kofridua, Ghana



(Photo: Sally Sutton)

(see Figure 5), the resultant increases in improved water supply can make a very significant contribution to the water supply MDG target, and to poverty reduction especially in the widespread scattered farming households of the alluvial plains, and the remoter woredas. At present it is calculated that over two million more people have improved access to water in the past two years in Oromia Region alone, and many of these are seeking further ways to improve their new asset⁸.

Private initiatives – Ghana

Many individuals in peri-urban areas with inadequate piped supplies are

progressively expanding their services to their neighbours, having started with just a small private well with rope and bucket to satisfy their own needs. By charging small amounts (almost always less than the public supplies and certainly far less than mobile water vendors), which they re-invest in the supply, they have managed to graduate from rope and bucket, to stand-posts with elevated storage and chlorinated supply (see Figure 6), and often have plans to continue on to providing house connections to their neighbours as well as their own houses.

The systems are sustainable, well maintained, the owner having good contact with pump suppliers, workshops, well-diggers and all the

other trades he needed to build up the supply in the first place (including temporary finance). Thus Self Supply is not limited to any particular technology, but only by the resources of, and technical support to investors.

Household water supply – Mali

In Mali approximately 5 million people take their water from traditional wells they have constructed themselves, either through their own labour or by paying someone else. Over 200,000 predominantly family wells (see Figure 7) are in use in rural and peri-urban areas, but with little private sector or government support. Over 90 percent are within 100 metres of the houses using them, and these people use almost twice as much water as those over 500m from their supply⁹. The majority of traditional wells here (83 percent), as was also found in Zambia, have less than 10 TTC/100ml, but 12 percent are significantly contaminated (>100 TTC/100ml). This is a situation where household water treatment (already being promoted and adopted by 25 percent of people in cholera areas), can make a significant addition to coverage, as could low cost improvements to the source itself.

These examples are not uncommon and family wells exist in large numbers (in millions) throughout Africa. They could become an asset rather than being viewed by sector professionals as a liability, not conforming to standards of construction or quality. Encouraging their improvement gives new opportunities to the private sector and can invigorate the rural economy.

Figure 7. Household well in Mali



(Photo: Sally Sutton)

Figure 8. Rainwater harvesting in Mozambique



(Photo: Sally Sutton)

Rainwater harvesting

In Uganda, the government has been piloting household rainwater harvesting with little or no subsidy for areas with poor groundwater¹⁰. Results have been positive but dilemmas over subsidies have slowed progress down. In Mozambique miners returning from South Africa have brought necessary knowledge of technologies and also resources back with them, leading to a growth of self-financed rainwater harvesting in water scarce areas such as Inhambane (see Figure 8), and incremental improvements as resources allow.

In many West African towns with high water tariffs similar developments of roofwater catchment have been undertaken by households reluctant or unable to pay year-round for water by volume, or suffering from unreliable supplies. However areas where rainwater can provide year-round supplies are limited by the pattern of rainfall in most countries.

Household water treatment

Marketing of household water treatment is still rather in its infancy and has related mainly to chlorination, and ceramic filters (e.g. www.pottersforpeace.org) but SODIS (www.sodis.ch) has also been promoted in areas such as the slums of Nairobi, and bio-sand filters (www.biosandfilter.org) generally through specific projects. Campaigns have been especially strong in cholera epidemics but this has often meant that chlorine is distributed for a few weeks and is not freely available on the open market. As a result anyone wishing to continue treating household water is often unable to buy the product. However use of laundry bleach, and increasing production by PSI and others (www.who.int/entity/household_water/resources) (Madagascar, Ethiopia, Kenya, Zambia, Senegal among others) of small bottles of low concentration hypochlorite is beginning to lead to a growth in water

treatment, starting in peri-urban and urban areas and with the potential to spread as a 'progressive' lifestyle to rural areas. Public and/or private partnerships on water treatment are likely to grow fast in the next few years, thus being an important element of Self Supply when married, where possible, to investment in household or small community water supply.

Countries considering Self Supply inclusion in strategies

Piloting of options for improved supplies for small communities is being carried out in Uganda, following on from a study of potential¹¹, and pilots in Zambia¹² have led to further community and private improvements and now new initiatives as part of government efforts to see whether Self Supply is relevant, effective and sustainable. In Uganda government is considering expanding Self Supply piloting from two original NGOs to fifteen, based on early results, and in Zambia UNICEF is starting piloting, with district councils in four districts of Luapula province. The Ethiopian government has recently stated that Self Supply is now an integral part of its Universal Access Plan and has commissioned a study into how to incorporate it into district plans, implementation and measures of coverage.

Overall there are signs of a shift in views, where countries are aware of the concept and as they reach a point in coverage and a deficit in funding where they see a need for additional strategies to reach MDGs.

Supply can contribute to MDGs

Box 3. MDG Contribution, Self Supply and the Eight Goals

Goal	Self Supply Contribution
1 Eradication of Poverty and Hunger	<p>Homestead –based technologies tend to be used most intensively for multiple uses (enhanced land and water productivity, rural livelihoods and gender equity)¹³.</p> <p>In South East Asia irrigation reduced poverty across all study systems¹⁴ and water supply improvements provided the opportunity to create income through micro–enterprises, as well as time released from water collection being converted into income earned¹⁵.</p> <p>In Mali a survey in two regions showed that 85 percent of water supplies with domestic and productive use were privately owned family wells⁹.</p> <p>Families with rope pumps generate an average of \$225 more per annum of income (ie about 50 percent above average), in Nicaragua¹⁶.</p>
2 Universal Primary Education	<p>A 12 percent increase in Tanzanian school attendance was found when water is available within fifteen minutes instead of being more than an hour away¹⁷.</p> <p>In Mali 95 percent of family wells were within fifteen minutes of the home, but only a third of communal wells⁹.</p>
3 Gender	<p>Household-level decision making generally favours greater input from female members. Men are more prepared to collect water from sources nearer the house, especially if access and/or site hygiene is improved¹⁸.</p> <p>Water provision close to the house offers women in particular the opportunity for productive use where their mobility is socially constrained¹³, and greater women’s empowerment through changing gender relations within the household¹⁵.</p>
4 Child Mortality	<p>Among children under five years in developing countries, diarrhoeal disease accounts for 21 percent of all deaths¹⁹.</p> <p>“Children with homes more than 500 m from their water supply had much higher rates of diarrhoea compared with children from houses with their own supply”²⁰.</p> <p>Fewtrell’s recent systematic review²¹ of high quality studies of household water treatment at the point of use and improved storage demonstrated a 34 percent reduction in diarrhoea.</p>
5 Maternal Mortality	<p>Reduced burden in water carrying during pregnancy, and possibly better post-natal hygiene can reduce complications.</p>
6 HIV/AIDS, Malaria/TB	<p>Easier availability of water for hygiene/hand washing which reduce opportunistic diseases and respiratory infections for HIV/AIDS and others²². HH Water treatment successfully prevented cholera transmission in adults and children²³.</p>
7 Environmental sustainability	<p>Sustainable development Self Supply offers sustainable technologies and management systems, spreads abstraction of groundwater among diffuse points and reduces concentration of livestock around water points. It may lead to increased abstraction but this tends to be naturally limited by its effect on the water table.</p> <p>Sustainable access to safe drinking water Access can be generally at household level, or near neighbour, where water is available within 15m of surface or as rainwater harvesting. Safety is ensured by household water treatment, which is now being widely promoted.</p>
8 Global Partnership for Development	<p>Capacity building In co-operation with the private sector, making available the benefits of new technologies, and re-inforcing decentralised capacity to respond to demands even with minimum resources.</p> <p>Youth job prospects Growth in demand for well-diggers, masons, blacksmiths and carpenters expands rural job opportunities. In Sierra Leone in association with the newly-formed well-digger union, ex-combatant youth have been offered job creation and credit systems to develop new marketable skills in water supply.</p>

Integrating new approaches into rural water supply strategy

Establishing new ideas within policy is a process which takes time (see Box 4), and needs good strategies in order to avoid early negative reactions. The process also allows development of a balanced view of positive and negative aspects, so that stakeholders can assess the relevance or irrelevance of such new approaches to their circumstances. A set of steps have been developed for the adoption of Self Supply in national policies and scaling up of the strategy.

Starting with a survey of what is already happening through user investment on the ground, and present progress to the MDG target, allows sector professionals and policy makers to become acquainted with the concept, to consider its relevance to them and any need for additional

strategies to those already applied. The establishment of the potential has therefore a dual purpose of sensitizing those in government not aware of what people are doing for themselves, as well as providing information upon which piloting and advocacy can be built.

Piloting gives the opportunity to test out the acceptability of different technologies and financing mechanisms to consumers, building up private sector capacity, and evaluating the demand for such an approach.

From this a package can be designed which covers appropriate forms of the building blocks to suit national and regional contexts, and which can act as a framework for going to scale. Once conceived, the package and the results from the piloting can be used in promotion to government and donors of the full-scale adoption alongside community based supplies.

Such promotion will facilitate any changes in policy and incorporation into planning as may be necessary for going to scale.

Major concerns

Common barriers to adopting lower cost options and private investment are summarised below.

Main barriers to adopting Self Supply alongside conventional approaches

- (a) Perceptions among politicians of going backwards.
 - Takes time to reverse, but strong rural demand, productive uses/poverty reduction, sustainability in remote areas are convincing
 - Misunderstanding over what Self Supply is are common at the beginning and so it needs careful definition and familiarisation with a new idea...if possible on the ground
- (b) Fears of poor water quality and reliability (see below topic on water quality).
- (c) View that low cost solutions are competing with higher cost ones.
 - Clear strategies need to be developed to give guidance on relative benefits and complementary nature of each approach
- (d) Preference for large contracts which are easily managed.
 - Not refutable, but also not sustainable or cost effective

Box 4. The Five Process P's for Integration

- **Potential**
Establishing the scope of Self Supply in a given region/country.
- **Piloting**
Testing out the package and demonstrating its relevance/limitations, monitoring impact/lesson learnt.
- **Package**
Modifying the package building blocks to be relevant to the specific conditions (physical, cultural, public and private sector).
- **Promotion**
Analysing results and disseminating them among government, NGO and donor communities.
- **Policy and Plans**
Adoption of enabling policies and plans for scaling up.

in several situations, including scattered housing (often up to 50% of rural populations), poor groundwater availability, remote areas, and small nucleated communities

- (e) Belief that end-users are not capable to choose.
 - Provision of good, unbiased information, and building on demonstrated ability to own and manage own supplies shows this to be a false assumption
- (f) Large subsidies to some options and none for others (see also below topic on subsidies to private supplies - parallels with total sanitation.)
 - Needs political decision on any subsidy to privately owned supplies which serve wider population, and micro-credit for those of most limited means

Water quality

This is justifiably the most often raised concern by sector professionals and politicians. It underlines a need for better data on water quality, but also improved understanding both of recent developments and consumer preferences and/or priorities. For consumers, convenience of supply and resulting increased productivity (indirectly through decreased collection time or directly through productive water use), are usually more important considerations than water quality²⁴ or health, despite their knowledge of risks. The Ethiopian and Zimbabwean strategies of

progressive improvement in supply, starting with access as a first step and with resultant improved productivity used to finance ways to improve water quality, offers a sustainable approach for those able to develop their own supplies.

Recent developments emphasise the degree to which 'safe' sources may actually not be safe (Ethiopian Rapid Water Quality Assessment²⁵ - 24 percent of boreholes and 34 percent of protected wells had more than 10 TTC/100ml) and more importantly that some 40 percent of water is contaminated between source and point of consumption⁵. As a result it has become more widely acknowledged that point of use (POU) water treatment is more effective than source water treatment or dependence on source protection to provide water of potable standards. Such POU treatment has resulted in anything between a 24²⁶ - 60²⁷ percent reduction in diarrhoeal disease. 2002 World Health Report (WHO) identifies POU treatment as the single most cost effective environmental intervention to prevent diarrhoeal disease. Thus Self Supply initiatives which include household water treatment may contribute to MDGs, possibly as a transitional solution, but are still being considered for JMP monitoring in case it is used as a reason for avoiding continued improvement to access.

Subsidies to private supplies – parallels with total sanitation

Another fear of politicians is that of subsidising privately owned facilities.

However there are a range of options to consider. One is to draw close parallels with sanitation policy, where householders are encouraged to follow a ladder of progressive improvement in the same way as Self Supply, deciding on what level they can afford to reach at any one time and being made aware of higher level alternatives to which they may aspire. In this option they cover all costs but strengthening of support to them, such as private sector capacity, availability of credit systems and new technologies are provided through donor support. Another option, similar to that offered in Zimbabwe is a small subsidy to components of the well, such as the windlass, or to cement as in Zambia. This still keep per capita costs well below those for community supplies, but offer incentives to families without distorting the market so far as to induce high donor dependency.

Conclusions

1. Self Supply can materially contribute to MDGs, including that for water.
2. The first steps on the ladder should be regarded as an asset (as they are by users), providing a contribution to poverty reduction and enabling owners to move further up the ladder sustainably to a point of reliability and safety in water quality through community and/or household solutions.
3. Donor and government inputs are mostly in the form of support to the four building blocks: introduction of new technologies and building advisory capacity, establishing micro-financial options, building capacity of

the private sector, and helping government to develop policies which encourage incremental personal investment. This is a less tangible donor investment than that put into hardware of boreholes and handpumps, but the capacities created are subsequently not donor-dependent and can offer greater sustainability and widespread continuing change, which can also benefit the more conventional community based approach which it complements.

4. Household water treatment is a cost effective measure which will be necessary for all supplies (other than house connections), if they are to provide safe supply at point of consumption, thus reducing the significance of source technology as an indicator of 'safe' water.
5. The potential for private investment in sub-Saharan Africa rural water supply is enormous, and the need to include it in coverage strategies will increase as rural coverage levels rise.
6. Self Supply in source up-grading, water treatment and rainwater harvesting need to be included in supply inventories and planning to reflect options which should be available for sustainable solutions in different physical and socio-economic environments.

End Notes

- 1 Human Development Report 2006 Beyond Scarcity: Power, poverty and the Global Water Crisis. UNDP 2006
- 2 Joint Monitoring Programme figures 2006
- 3 Accra Forum Declaration November 2006 RWSN Proceedings
- 4 Noel S, Soussan J, Thao NP (2006) Productive use of water, a household level study from Vietnam, WEDC 32nd conference proceedings
- 5 Gundry S et al (2006) Contamination of drinking water between source and point of use in rural households in South Africa and Zimbabwe: Implications for monitoring the MDG for water. Water Practice and Technology IWA Publishing
- 6 WSP, P Morgan (2002) Up-graded Family Wells in Zimbabwe: Household Level Water Supplies for Multiple Uses. Field note 6. Blue Gold Series, WSP
- 7 WASH Inventory Atlas of Zimbabwe March 2006
- 8 S. Sutton (2007) Report on Ethiopian Self Supply Potential and Initiatives. RWSN website
- 9 Maiga H, Maiga B, Sutton S (2006). Improving Household Water Supply (Self Supply). The Potential in Mali. RWSN with WaterAid and UNICEF
- 10 Thomas.T (2005) Mainstreaming roofwater harvesting. Ugandan experiences. Presentation IRCSA XII New Delhi
- 11 Carter R, J Magala, J Ssebalu (2005). Self-help Initiatives to Improve Water Supplies in Eastern and Central Uganda, with an emphasis on shallow wells. A Case Study of the RWSN Self-Supply Flagship. Draft Final Report July 2005
- 12 WSP,S.Sutton (2004) Self Supply: A fresh Approach to Water for Rural populations. Field Note RWSN/WSP
- 13 Van Koppen B, Moriarty P, and Boelee E (2006) Multiple Use Water Services to Advance the MDGs. IWMI Research report 98
- 14 Hussain I, (2005) Pro-poor interventions strategies in irrigated agriculture in Asia. Final synthesis report Manila, ADB/IWMI
- 15 A.J. James, Joep Verhagen, Christine van Wijk, Reema Nanavaty, Mita Parikh & Mihir Bhatt, (2002) Transforming time into money using water: A participatory study of economics and gender in rural India, Natural Resources Forum, Volume 26 Issue 3 Page 205-217, August 2002 Blackwells
- 16 Alberts J and van der Zee (2003), A multi sectoral approach to sustainable rural water supply: the role of the rope handpump in Nicaragua. Conference paper on WCAInfonet
- 17 WaterAid (2004) No water no school. WaterAid Website
- 18 Sutton S (2002) Community led Improvements of Rural Drinking Water Supplies. Final Report KAR R7128. DFID
- 19 WHO website 2007
- 20 Anna Cornelia Gorter (1998). Childhood diarrhoea and its prevention in Nicaragua. University of Maastricht
- 21 Fewtrell L, Kaufmann R, Kay D, Enanoria W, Haller L , Colford J (2005). Water, sanitation, and hygiene interventions to reduce diarrhoea in less developed countries: a systematic

End Notes

- review and meta-analysis. *Lancet Infect. Dis.* 5:42-52
- 22 Luby SP, Agboatwalla M, Feikin DR, Painter J, Billhimer W, Altaf A, Hoekstra RM. (2005) Effect of handwashing on child health: a randomised controlled trial. *The Lancet*, Volume 366, Pages 225-233
- 23 Gundry S, Wright J, Conroy R (2004) A systematic review of health outcomes relating to household water quality in developing countries. *Journal of Water and Health* 02.1 IWA Publication
- 24 O. Mills (2006) Stakeholder perception of Self Supply. Cranfield MSc Thesis. Draft Final Report to Uganda Self Supply Steering Committee
- 25 WHO/FMH, EHNRI/UNICEF (2006). Rapid Assessment of Drinking Water Quality in the Federal Republic of Ethiopia. Country report
- 26 Reller ME, Mendoza CE, Lopez MB, Alvarez M, Hoekstra RM, Olson CA, et al.(2003) A randomized controlled trial of household-based flocculant-disinfectant drinking water treatment for diarrhea prevention in rural Guatemala. *Am J Trop Med Hyg.*; 64:411-9
- 27 Clasen T, Brown J, Suntura O, Collin S, Cairncross S (2004). Reducing diarrhoea through household-based ceramic filtration of drinking water: a randomized, controlled trial in Bolivia. 2004. *Am J Trop Med Hyg*



The Water and Sanitation Program is an international partnership for improving water and sanitation sector policy, practices, and capacities to serve poor people



The Rural Water Supply Network RWSN is a global knowledge network for promoting sound practices in rural water supply

About the author

Dr. Sally Sutton is the RWSN Self Supply Flagship Theme Coordinator. She has more than 30 years experience in rural water supply, starting as a practical hydro-geologist and moving increasingly into planning and evaluation, systems and policy development for improved sustainability. A major interest is in helping to bridge the gaps which often exist between end-users and policy makers/sector professionals, so that consumers have informed access to a wider range of options which reflect their concerns and values.

February 2009

Water and Sanitation Program - Africa
World Bank
Hill Park Building
Upper Hill Road
PO Box 30577
Nairobi
Kenya

Phone: (+254) 20 322 6334
Fax: (+254) 20 322 6386
E-mail: wspaf@worldbank.org
Website: www.wsp.org

The RWSN Secretariat is hosted by:
Skat Foundation, Vadianstrasse 42
CH-9000 St.Gallen
Switzerland

Phone: +41 71 228 5454
Fax: +41 71 228 5455
E-Mail: rwsn@skat.ch
Web: www.rwsn.ch

Author: Dr Sally Sutton

Peer reviewers: Zahra Ayadi and Jerome Rihouey (WSP-Africa), Egbert Schrotten and Boniface Aleobua (OWAS/AfDB), Erich Bauhmann (RWSN)

Prepared under the guidance of the RWSN secretariat

Contacts: Dr Sally Sutton
sally@ssutton.fsbusiness.co.uk and
Kerstin Danert
kerstin.danert@skat.ch