

# Accelerating Self Supply

Summary of progress in introducing a new approach



## Executive Summary

It is becoming clear that household capacity, household priorities and the power of real ownership have already been strong drivers for rural dwellers to improve their own water supplies through their own efforts (Self Supply). The findings from assessing and piloting Self Supply acceleration in Ethiopia, Mali, Uganda and Zambia suggest that encouraging household investment can truly offer a viable option alongside conventional highly-subsidised community water supplies. Self Supply and its acceleration can help government and planners to reach the MDG targets for access to safe water, and ultimately universal access, especially in areas which are difficult to serve adequately with community supplies.

The process of introducing a new approach has been found to need champions in each country. Early studies of potential help to raise awareness and develop interest, and both aspects need initial technical support from research bodies or NGOs to get the process started.

Piloting has been successful in four very different contexts. Rural dwellers in Ethiopia, Mali, Uganda and Zambia have clearly demonstrated that they are able to improve their own water supplies given encouragement and support. The achievements on the ground may be small in scale but have been great in their effect on attitudes to Self Supply, especially at district and household levels, but also among sector professionals. This is due to the fact that people have been able to see the concept *'in action on the ground'*.

Financial investments in infrastructure by external agencies are shown to be not always necessary and can even undermine later attempts to scale up. However, there is a need to ensure that policies encourage individual initiatives, that there is technical advice for consumers, that a local private sector is built up and that savings or loan mechanisms are available. In order to moving from pilots to scaling up, public and private capacity needs to be built up to provide good support to water users. A prime role of government is also to define what water sources will be considered 'safe and reliable' and to ensure that the poorest are not left behind.

It can take five years or more for Self Supply to be fully included in national strategies and to be brought to scale on the ground. In the four piloting countries, the organisations leading the way have been different (Ministry of Water Resources in Ethiopia, Ministry of Health in Mali, Ministry of Water and Environment in Uganda and UNICEF in partnership with WaterAid, DAPP and Ministry of Local Government and Housing in Zambia). However, inputs from government, Non-Government Organisations and the private sector are all required, with their respective roles changing over time.

In Ethiopia, Self Supply has been incorporated into the Universal Access Plan, which advocates for low-cost technologies as well as household and community investment in rural water supplies. In the other three countries, the Self Supply approach has been accepted into national strategies for health or rural water, but has yet to be fully incorporated into written policy documents.

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## Abbreviations

DAPP	Development Aid from People to People
HDI	Human Development Index
JMP	Joint Monitoring Programme (WHO/ UNICEF)
MDG	Millennium Development Goal
NGO	Non-Government Organisation
RiPPLE	Research-inspired Policy and Practice Learning in Ethiopia and the Nile region
UAP	Universal Access Plan
SOMAP	Sustainable Operation and Maintenance Project for Rural Water Supply (Zambia)
UMURDA	Uganda Muslim Rural Development Association
WEDA	Wera Development Association

## The Self Supply Approach

### Supported household investment in water supply

Approximately one billion people around the world do not have access to a safe and reliable water supply at a reasonable distance from their home. Many more consider their existing water supply to be inadequate in terms of quality, quantity, reliability or convenience. Consequently, increasing numbers of households have improved their own water supply in small and affordable steps using their own resources. Their capacity to do so and the advantages this may bring are seldom recognised or built upon.

Conventional community supply refers to heavily subsidised water supply services which are implemented by Governments and NGOs and then managed by communities. Supplies that have been improved with household investment are particularly relevant in small or remote communities, and where there is easy access to groundwater or plentiful rainwater.

Under the Self Supply flagship, the Rural Water Supply Network (RWSN) is encouraging authorities, NGOs and the private sector to recognise that many households and small groups can actually construct, or pay for, the construction of wells and rainwater harvesting facilities. Households can also improve water quality by upgrading existing water sources or undertaking household water treatment, or a combination of the two. Many are showing the demand for such improvements as well as the constraints which they face in achieving their aims.

To enable and encourage them to make such investments, four supporting pillars are required (Sutton 2009a):

- Policies which encourage individual initiatives
- Technology and technical advice for consumers
- A developed private sector
- Access to micro-credit or savings mechanisms

The overarching aim of piloting initiatives in the four countries of Ethiopia, Mali, Uganda and Zambia is the establishment of these pillars to create an enabling environment and ultimately take the Self Supply approach to scale.

This document is the final of a set of five field notes. Four of the reports present progress in countries (Ethiopia, Mali, Uganda and Zambia) which have been piloting Supported Household Investment in Water Supply - Self Supply. This document draws together the lessons from experiences in these countries.

## Introduction

The 'Self Supply' theme of the Rural Water Supply Network (RWSN) was introduced as a concept at the Durban Forum in 2003, and raised considerable interest. As a result, in 2004, WaterAid funded a desk study of the potential for Self Supply in sub-Saharan Africa to determine countries which might have the highest potential for such an approach. The findings of this study (Sutton 2004) combined with country reconnaissance visits and the RWSN Accra forum in 2006 (RWSN 2006) reinforced the interest raised in Durban and led to selection of four countries in which to pilot Self Supply. Selection was based primarily on key features including:

- significant areas with shallow, good quality groundwater
- well-established traditions of digging family wells
- high interest shown in Self Supply by influential people within government and donor organisations.

- Inadequate progress in meeting targets for access to improved water supplies due to:
  - escalating costs
  - reducing community response
  - increased remoteness and scatter of consumers
  - low sustainability of new supplies leading to short lived increases in access.

Activities were first concentrated in Mali and Uganda in 2005 and included Ethiopia and Zambia from 2007. These countries all showed concerns over reaching their respective Millennium Development Goal Targets of access to safe water in rural areas by 2015 with available funds. Each country also had other related advantages which indicated that Self Supply might be a relevant approach for authorities and end-users:

- The **Ethiopian** Government had already undertaken mass campaigns on well digging and small-scale irrigation and so had experience and social mechanisms in place to promote Self Supply. In 2005 it also set a target of universal access for rural water by 2012. With such a large rural population, this was proving difficult to achieve.
- A government inventory of water points in **Mali** in 2004 showed high dependence on household supplies with over 200,000 traditional wells (or one per 4-5 households). The very fact they were recorded (which is not the case in most countries) indicated that sector professionals were aware of their importance to end-users.
- In **Uganda**, coverage was relatively high and progress good. However, increasing difficulty was being found in providing a sustainable service to the remaining communities because per capita costs were escalating.
- In **Zambia**, the value of Self Supply lay particularly in the large areas of the country with very low population density and highly dispersed small communities. It was difficult to provide these communities with conventional community supplies on a sustainable basis. Previous efforts by the Department of Water Affairs and the Ministry of Health had revealed a significant demand at grassroots level for self-financed water supply improvement.

**Table 1 Self Supply Piloting Focal Country Statistics**

Geographic context						
Country	Total Population (JMP)	Rural Population (JMP)	Land Area sq/km	Rural pop density per sq/km	Unimproved Rural (JMP)	Unimproved Rural (JMP)
Ethiopia	80,713,000	66,992,000	1,000,000	67	74%	49,574,000
Mali	12,706,000	8,640,000	1,222,190	7	56%	4,838,000
Uganda	31,657,000	27,542,000	197,100	140	36%	9,915,000
Zambia	12,620,000	7,800,000	743,398	10	54%	4,212,000
Economic indicators						
Country	HDI ranking (UNDP 2010)	Pop <\$1.25/day (UNDP 2010)	Life expectancy (UNDP 2010)	Labour force in Agriculture (CIA 2009)	Economic Growth (AEO 2009)	
Ethiopia	157	39%	55.1	80%	11.6%	
Mali	160	51%	49.2	85%	3.6%	
Uganda	143	51%	54.1	82%	7%	
Zambia	150	64%	47.3	85%	5.5%	

**Information sources:** See reference list. Note - JMP (WHO/UNICEF 2010) - Joint Monitoring Programme Data of 2008

The four focal sub-Saharan African countries in which RWSN has concentrated its technical support are all land-locked but otherwise show a range of very different physical, economic and cultural features (Table 1). Physical conditions range from desert to tropical conditions and from mountains to some of the lowest and hottest points on Earth.

- **Ethiopia** consists mainly of a vast highland complex of mountains and dissected plateaus divided by the Great Rift Valley, surrounded by drier lowlands and semi-desert.
- **Mali** covers an even bigger area, reaching into the heart of the Sahara, but extending along the more hospitable banks of the Niger River, where most of the population is concentrated, in the South.
- **Uganda** lies mainly within the Upper Nile Basin, and is formed by an extensive plateau with largely tropical conditions and much surface water as well as relatively high rainfall, but with more drought-prone conditions in the Karamoja region to the north-east.
- **Zambia** also lies mainly on a tropical plateau of crystalline basement rocks, which in this case is drained by the Zambezi and the Congo rivers and their numerous tributaries.

All of the selected countries have a predominantly rural population, with Zambia being the most urbanised, partly as a result of its higher industrialisation through copper mining and processing. However, past declines in copper prices mean that unlike other African countries, the urban proportion of the population has been shrinking, rather than growing. Mali also has a relatively highly urbanised population, with almost a third living in towns and cities, whilst less than a fifth are urban dwellers in Ethiopia and Uganda.

Ethiopia has the largest rural population in the sub-Sahara Africa Region after Nigeria, and also a relatively high density of rural people. This is in direct contrast to Mali, which has a tenth of the Ethiopian rural population but in an even larger land area. Mali and Zambia face the major challenge of providing rural services to very low density populations (10/km<sup>2</sup> or less), a high proportion of whom (>75%) earn less than a dollar a day. Access to improved water supplies is progressing slowly in Mali and Zambia, partly because of low population density. These two countries also experience the lowest life expectancy, with Zambia the worst off as a result of the high incidence of HIV/AIDS.

In all cases, the rural population consists of a predominantly farming economy with 80% or more of the labour force in agriculture. Ethiopia experienced the highest economic growth in 2007 and 2008 (over 11%). Mali, with the lowest growth of 3.6%, is also the lowest in the Human Development Index ranking. Encouraging self-financed initiatives may prove easier where the economy is growing most strongly, reflecting how water supplies and sanitation services became established in other countries during periods of maximum economic growth (e.g. during the Industrial Revolution).

Religion and culture have significant effects on beliefs with respect to health, family priorities, responsibilities towards one's neighbour and other practices in water and sanitation. Whilst Mali is predominantly a Muslim country, in Ethiopia about a third of the population follow Islam (ARDA 2011). Christianity forms the main religion in Zambia and in Uganda (UBOS 2003). In all cases traditional beliefs are also strong and affect many aspects of life and of values held.

## The Innovation Process

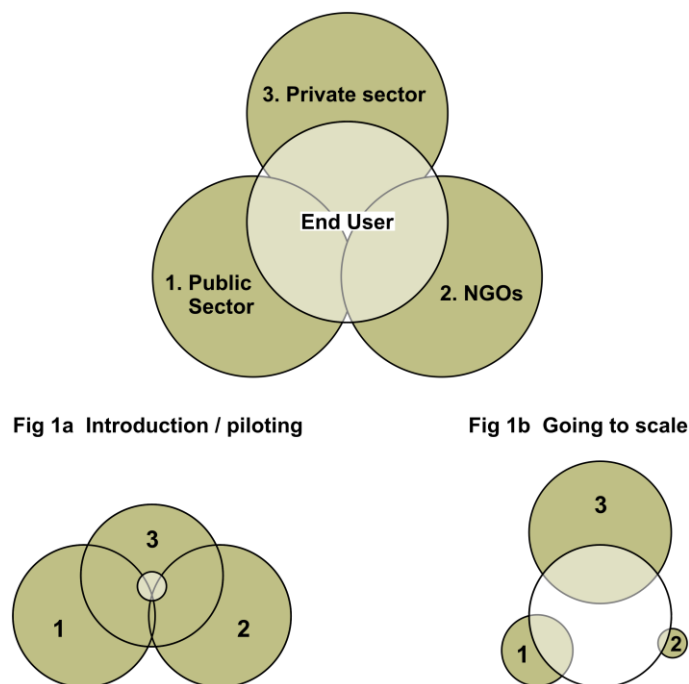
### Processes involved

Introducing new approaches or new technologies requires careful strategic planning. Sutton (2009a) sets out five processes for the integration of innovation:

- Assessing potential – establishing the scope for Self Supply in a given region or country
- Piloting – testing out options, demonstrating relevance, limitations, monitoring impact and learning lessons
- Modifying a package of necessary building blocks for the specific conditions
- Promotion, analysing results and disseminating them among government, NGOs and donors
- Adoption of enabling policy and plans for going to scale.

The time required to go to scale depends on the extent of efforts, funding and its continuity. Experience shows that it can take five years or more for Self Supply to be fully included in national strategies.

**Figure 1 Balancing Support to End Users/Investors**



For successful introduction and going to scale, it is necessary to develop a relationship between: 1) government, 2) Non-Governmental Organisations (NGOs) and 3) the private sector. These three players encourage end-users to invest in improving their water supplies. The support requirements change over time (see proportional spheres in Fig 1a and 1b). Initially perhaps, government will choose the technologies and promote household investment. Ultimately, unless governments are providing significant subsidies, it must be end-users who choose technologies and the private sector which markets their skills and products to the end-user.

In the early stages, a technical advisory or research organisation may also be involved in getting the process started (the role

taken by RWSN in this case). Alternatively, it may be a private company promoting its own product.

The roles of support organisations and the end-user at each stage of the process depends on the policies in the country, the availability of NGOs and the strength of the private sector. Frequently, the private sector has little experience of the new products and thus little capacity to produce or market them. Enterprises will thus require familiarisation and training by government or NGOs. However, by the time of going to scale, the private sector should be capable of providing most of the necessary services. Thus the role of NGOs would diminish, and the government would take on a more a regulatory one (Fig 1b).

### Country Approaches

The acceleration of Self Supply is developing differently in each of the four focus countries. This is both due to the interests of individuals involved and sector policies. Thus the lead organisation varies:

- Ethiopia** Ministry of Water Resources and regional Water Resources Boards, supported by UNICEF and the Water and Sanitation Programme (WSP)
- Mali** Ministry of Health, (Department of Public Hygiene and Health), supported by UNICEF, with inputs by the Direction National d'Hydraulique
- Uganda** Ministry of Water and Environment
- Zambia** UNICEF, in partnership with WaterAid and DAPP and with monitoring by the Department for Infrastructure Services and major inputs by the Ministry of Health (Environmental Health)

Ethiopia has initially concentrated on the relevance of the approach to its Universal Access Plan (UAP) and how to incorporate low cost options and household investment into government strategy. The other three countries have all been piloting the approach to see what it means on the ground and whether the results justify incorporating it into their strategies for health (risk reduction) or water (access and reliability of quality and quantity). Table 2 sets out the current roles of the various players.

**Figure 2 Family well in Mali**



## Country Achievements

### Assessing potential

The first stage of defining the potential has generally proved an essential and effective step in establishing the concept within government and raising interest in exploring further the relevance of Self Supply to national rural water strategies. In most cases, one or two government and/or NGO personnel were already interested in the approach, largely as a result of the RWSN forums and advocacy. For them to convince their colleagues, however, that the concept had something valuable to offer required solid evidence both of what rural people were already able to achieve for themselves and the potential for extending these initiatives to help towards achieving MDG targets. It became clear early on that decision-makers generally want evidence on the ground locally and not anecdotal evidence or even academically rigorous research from countries of which they may have little or no experience. Studies were therefore initiated in each country, usually following on from a RWSN reconnaissance visit and discussions with government officials in water and/ or health ministries. Findings of the assessments are summarised in the accompanying country reports (Sutton 2010a; Sutton 2010b; Sutton 2010c; Danert and Sutton 2010).

Mali and Uganda were the first two countries in which studies of potential were initiated in 2006, and assessment reports and articles produced (Maiga et al 2005, Sutton et al 2006, Maiga et al 2006, Carter et al 2005). In Mali both the Ministry of Health and the Ministry for Water provided major inputs to survey design, with WaterAid as the coordinating NGO. In Uganda, the Ministry of Water and Environment picked up the idea and requested WaterAid to contract the study with funds from WSP. In both countries the follow-up workshops discussing the study findings led directly to government deciding to support piloting. In the case of Uganda this was done within already allocated donor/government funds, whilst in Mali a proposal for funding was made as part of the potential assessment and was used by UNICEF to access funds to support the Ministry of Health.

Following assessments and piloting of self-financed source improvements carried out in a DFID research project in 1998-2001 (Sutton 2002), WSP commissioned a study of Self Supply potential in Zambia in late 2006 (Roche 2007). In 2007, reconnaissance visits were made to Ethiopia by RWSN (Sutton 2007a) and Zambia (Sutton 2007b), followed by plans for studies of potential and plans for implementation (Sutton 2007c; Sutton 2007d). Following on these RWSN visits, UNICEF Zambia entered into a Project Co-operation Agreement with DAPP and WaterAid to make more detailed studies of potential in the districts where they would concentrate piloting (UNICEF/DAPP 2008, Zulu Burrow 2008, Munkonge and Harvey 2009).

**Table 2 Partner Roles and Responsibilities**

Country	Government	Donor/NGOs	Private Sector	Investors/users
Ethiopia	Developing strategy & promoting scaling up. Training artisans, deciding on subsidy and role of private sector, advising investors	UNICEF and WSP providing technical assistance, funding regional studies and piloting, supporting government in benchmarking and strategy development.	Low cost pump production &, marketing. Providing services in well-digging and improvement and also in higher cost technologies and household water treatment.	At present cover 100% of the cost. Deciding on technology level, uses of water & who has access. Government policy on self-financing still being developed.
Mali	Technical training of private sector, planning piloting and going to scale	Providing cement, funding training/manuals (UNICEF), technical assistance (WSP). No NGO inputs.	Providing services in well-digging and improvement, household water treatment chlorine.	Covering 40% of costs, planning timing and level of technology. Sharing supply with neighbours
Uganda	Planning areas of intervention, training district staff, contracting NGOs for piloting.	WEDA and UMURDA: training to private sector, promotion & monitoring results.	Providing services in well-digging and improvement.	Covering 40% of the costs, planning level of improvement. Sharing private supplies
Zambia	Assessing action research impact on Rural Water Supply strategy, health extension workers promoting risk reduction.	WaterAid and DAPP. Technical training to private sector, and to CBOs in microcredit funded by UNICEF.	Marketing well improvements and rope pumps. Setting costs. Providing services in well-digging and improvement	Owners pay 100% costs of improvements, decide technology level, plan expenditure and timing, organise loans, contract private sector.

## Piloting

Three countries have undertaken piloting. Results are discussed in more detail in the country reports associated with this document (Sutton 2010a, Sutton 2010b, Sutton 2010c, Danert and Sutton 2010). RWSN have as far as possible ensured that there is documentary record of the process in each country. The achievements on the ground may be small in scale but have been great in their effect on attitudes to Self Supply, especially at district and household levels, but also among sector professionals. This is due to the fact that people have been able to see the concept '*in action on the ground*'.

Again the contrast in approaches between countries shows that flexibility is needed in introducing new ideas, and what is right for one is not necessarily right for all. The situation for each country is summarised below.

## Mali

Implementation is through Ministry of Health providing cascade training to districts and so on, to health centres and at community levels (Sutton 2009b). 13 communes in 9 districts had been covered by early 2010. Training is given to artisans (masons and well-diggers) as well as health professionals. Health management committees and artisans promote/market supply improvements and supply advice as well as some materials. Over 300 supplies had been improved directly in 18 months on well-owners' (community or more often household) initiative and with 40% cost recovery. A further 25% (at least 75) of wells had been significantly upgraded on their owners' initiative and at 100% their own expense, using the trained artisans.

Others have copied individual features of well-protection in their own ways, showing that the piloting has not only established a long-term capacity for good quality supply improvements, but also created a growing demand and understanding of the principles.

**Figure 3 Mali traditional well with minimal protection**

## Uganda

In 2007, some 41 sources were improved through piloting, benefiting an estimated 3,600 people (Kiwauka 2008). The implementing NGOs (WEDA and UMURDA) worked with local government and communities to develop methods of promotion, with well-owners contributing 40% of the cost. This was in two districts, but further districts are interested in taking up the idea. However, the Ministry of Water and Environment has promoted well-upgrading in over 30 more districts and with 40 NGOs. Household rainwater harvesting has been even more widely promoted to improve coverage in areas with poor groundwater potential. The degree to which other supply owners are replicating improvements has not yet been monitored, so the sustainability of what has been established remains to be seen. A guiding framework for Accelerating Self Supply is currently under development (Danert & Sutton 2010) to support to Self Supply on a country-wide basis.

## Zambia

Piloting has progressed further in Zambia. Two NGOs (WaterAid and DAPP) have worked in very different ways to provide an enabling environment for water supply improvement (Sutton 2009c). Both require all direct costs to be covered by supply owners and communities. Outside funds are used only for training, monitoring and supervision as well as development of the process and the establishment of revolving funds.

WaterAid have put most resources into training artisans to a high level (brick-laying/masonry, welding, and carpentry as well as sanitation and water supply technologies). Health management committees and other local Community Based Organisations are also trained in the basics of Self Supply, and in some cases in management of revolving funds. The result is that marketing and promotion of Self Supply is not project dependent.

Over a period of a year in one district, over half of the traditional well-owners had made at least one improvement, ranging from concrete apron with a well-mouth cover fitted with a lid to a fully-lined well fitted with a windlass and drainage system. Training has been given to 16 masons, but they wish to pass on their training to others as they feel the demand for their skills is now too high. The initial investment will provide various indirect benefits as well, both to the rural economy and to well-owners in neighbouring areas.

DAPP has taken a different approach, providing less training and concentrating more on developing simple low-cost techniques for reducing risks of water contamination and using their community facilitators to promote these through village WASHE committees. Materials required are all traditional and locally available (Figure 4), and the measures being promoted are simple and easily copied. In Nchelenge and Chiengi districts, 95% of the initial 516 well-owners have made at least one level of improvement to their water points (mostly apron, lifting device and drainage). Both WaterAid and DAPP have developed systems for which no subsidy is necessary, highlighting the fact that in such a multi-disciplinary sector, more than one approach may be appropriate to reach similar objectives.

**Figure 4 Improved well protection in Zambia**



**Figure 5 Self help well construction in Ethiopia**



## Policy and planning

### Ethiopia

Ethiopia is the only country which has started from the policy end of the process, and is looking at how Self Supply can best contribute to the Universal Access Plan, learning from what people are doing for themselves already. Following RWSN visits and reports, the Ministry of Water Resources commissioned consultants to assess Self Supply around the country, discuss issues with regional authorities and make recommendations on strategy. To assist in this process, UNICEF and WSP supported a national workshop to debate Self Supply issues (MoWR /UNICEF/WSP 2008). A reformulated UAP strategy has now been approved by government to guide implementers over the period to 2010 and beyond (MoWR 2009). This re-formulation advocates a greater move towards low-cost technologies and household and community investment and management to reach universal coverage.

In addition, benchmarking studies in two regions (Oromia and SNNPR) are being undertaken by UNICEF and RiPPLE. The RiPPLE study looks at socio-economic as well as performance aspects of Self Supply systems. Both studies will help to define the levels of protection necessary to be regarded as an acceptable level of supply for households or for communities, based on the performance of systems already in place. The same is needed in other piloting countries.

**Figure 6 Early Self Supply demonstration in Ethiopia**



## Issues Arising and Lessons Learnt

The processes of introducing a new approach and the assessments and piloting are all providing lessons which are of relevance to wider rural water supply strategy, and to any moves to go to scale or to introduce Self Supply to new countries.

### Strategic issues

#### Moving from piloting to scaling up

Piloting has generally shown both a very positive response from households and from district administrations, which are generally coping with limited funding and low capacity. In order to go to scale, a clear picture is required of what needs to be in place alongside plans to progressively reduce the dependence on outside funding (i.e. Government, NGO or donor). This entails significant changes in attitude by policy makers, planners and consumers.

It also means building up public and private sector capacity to provide long term support and promotion, and to define their roles. This is easier with the model of introduction developed in Zambia by WaterAid and UNICEF, where a zero subsidy is combined with training of local entrepreneurs, alongside encouragement by local government and health centres to provide advice and market the idea. Initially piloting was done through international NGOs but UNICEF is now trying a similar exercise through local government. Both will provide valuable lessons for scaling up.

Dependence on NGOs for facilitating the process has advantages but as Uganda has found, both in rainwater harvesting and source up-grading, the danger is that the technology or approach is then not easily able to spread beyond the focal communities or areas. A decision needs to be made by government as to whether going to scale will be something achieved through a) government promotion, training and advisory services and/or b) private sector up-take and promotion because returns are attractive and/or c) NGO training and promotion. The way piloting is set up should reflect the plans for going to scale.

If the main aim in going to scale is to create an enabling environment within which those who wish to can more easily access services and products for improving their supply, then the necessary supporting pillars need to be developed alongside the demonstration of purely technical options. In Mali and Uganda the lack of development of **financing mechanisms** has constrained user investment. In all four countries a **weak private sector** and the lack of a comprehensive package of **advice** on a full range of technical options means that some basic constraints to improvements still remain. It is suggested that all four supporting pillars (technology and technical advice, well developed private sector, financing options and enabling government policies) need to be clearly defined and put in place for scaling up. Trying to scale up with, for instance only government promotion or only provision of loans will limit up-take and the range of beneficiaries.

#### Benchmarking and regulation

Government needs not only to decide on the strategy for going to scale but also on their roles in the establishment and promotion of Self Supply. A major concern of theirs is that households investing in water supply should be providing a safe and reliable

supply. This reduces the demands on inadequate donor and government funds while still increasing coverage. A prime role of government is thus to define what level of protection and supply will count as 'safe and reliable' and to ensure that the poorest are not left behind.

So far, acceptable technologies are poorly defined, with much opinion based on assumed technical performances, not on actual results. Lower standard designs need to be considered for household as opposed to community supplies. Probabilities of contamination need to be viewed in the light of actual (imperfect) performance of conventional community supplies in this regard, especially when water is contaminated between the source and point of consumption. Standards and water quality should also be related to per capita and per unit costs. Ethiopia is keenly aware of the need to define actual performance and risks. To date none of the piloting countries has accumulated reliable and comprehensive data on water quality or reliability of supply. This is not only the case for self supply, but also for the community supplies constructed for many years.

Actual performance links also to governments views as to their role in regulation. In the case of Self Supply it may be said that there are parallels to Food and Hygiene. Governments do not generally consider they have a role of regulation for practices and tools in the kitchen when it is for a family alone or even a group of families when others are invited in to eat. The role of government is simply to provide advice and information from which households can make an informed choice as to what level of safety they intend to adopt. Only if they begin to sell their food and so imperil the public more widely for their own benefit, would regulatory procedures come into play. At present few countries monitor conventional rural water supply systems adequately. Arguably these should be better regulated first, before putting household supplies under the spotlight.

#### Planning and Meeting Targets

Governments want to be able to reach targets and plan progress. Self Supply piloting shows that private individuals are driven by very different values. They respond to market forces and may be constrained in their plans at times by fluctuations in income, the supply of materials and products and seasonal demands. Thus although the outputs from Self Supply may contribute to coverage, it is difficult to predict the rate at which they will do so.

If the main aim of Self Supply is to create an enabling environment which responds to market forces and supports any community or individual who wants to improve water supply, prediction is difficult. However, outside funding needs are low. Gaps in existing water coverage may be filled, but in some areas service levels may be higher as people opt for a more convenient source. In all piloting countries it is not uncommon to find individuals digging a well within less than a hundred metres of a functioning community supply. The resultant household supplies will reduce pressure on communal supplies and allow economic uses of water. This can contribute to a range of MDG targets, including poverty reduction. It should also be noted that a strengthened private sector may be in a stronger position to support conventional community supplies (e.g. the Zambian SOMAP system) at sub-district level.



**Figure 7 Simple Well Construction, Oromia, Ethiopia**



A different set of conditions may exist where government wants Self Supply to provide improved water supplies because low population density and/or remoteness make conventional community supplies difficult to establish sustainably. In this case individuals will be fulfilling the role that government has taken elsewhere, in being providers of water in a formal capacity. If these supplies are to be included in planning and coverage statistics, there may be a need to use incentives for home-owners to take the responsibility to reach government targets in a given time.

Ideally, Self Supply sources should be included in water point inventories. Without their inclusion it is difficult to assess the potential of different areas, to target promotion where it is most effective and to avoid planning conventional supplies where alternatives may be more sustainable. The contribution that Self Supply systems may be making to coverage cannot be defined if there is no information on where they are or what level of service they provide.

### The Role of Non-Governmental Organisations (NGO)

The role of NGOs depends on country attitudes to their involvement and the stage of the process of introduction. In piloting their involvement has ranged from being the major facilitators, planners and channel for funds (Uganda), through being a way to establish a long-term sustainable support system (Zambia), to having no role (Mali).

Government capacity is frequently insufficient to provide all the necessary support, especially if there are major supply construction programmes going on at the same time. Sector professionals in water tend to give priority to higher technology options and may need sensitisation in the value of lower cost alternatives. In such cases NGOs can provide the sensitisation to local government and help initial planning. This can enable Self Supply support to be quantified, costed and fitted into budgets.

In order to go-to-scale and avoid dependency on NGOs, their role should generally not be in community sensitisation, apart from developing the methods and materials for public and private sector use. The earlier that health and water ministries are encouraged to begin to put support to Self Supply into their budgets, the better. Such support fits well both with the technical and financial levels available in de-centralised systems. In summary, NGO inputs may be essential initially but should be planned with phasing out in mind.

## Technical issues

### Technology range and advice

The studies of the potential of Self Supply highlight that there are a very large numbers of privately owned supplies and that these are not limited only to low cost options. People invest in whatever they can afford so as to improve what they already have. For example a peri-urban dweller with access to an unreliable piped water supply and electricity may invest in a ground storage tank and a low lift pump or in a borehole and a submersible pump. A country dweller may improve access with an unlined well and a bucket and rope but may eventually buy a solar pump.

The piloting work so far has shown that there is a need for information on costs, performance, stockists, installers, potential economic returns, and sources of micro-credit. A good promotional brochure is also needed on technical options in rainwater harvesting, source improvement, water lifting and storage. A local directory at provincial or district level can provide information on:

- Well-diggers, masons, mechanics and plumbers.
- Traders with contacts to access mechanical, solar and diesel and low cost hand pumps.
- Sources of micro-credit and ideas on traditional savings schemes.

An NGO could form the advice centre but it would be more sustainable if it were a capacity built up in the private sector or in a health or water department as these are less dependent on outside funding. It is very important to consider the long-term reliability of support from the outset.

**Figure 8 Rural Artisans Trained by WaterAid to make a living protecting family wells in Luapula, Zambia**



### Technology choice

Information is needed for householders to make informed choice, but the range of options should be as wide as possible. It is necessary for sector professionals to recognise that an unlined well with minimal protection forms an early stage on the technology ladder. It allows a family to take water from closer to home for some or all purposes, leaving more time for income generation and child care. They are then in a better position to reach further up the ladder.

Dismissing these early stages as having no value ignores the value for which the owner invested in them and the size of step affordable to rural people. In Uganda Danert and Motts (2009) point out that promotion of too large a rainwater storage container (4000 litres) may be putting up-grading out of the reach of most. In Zambia up-take of rope pumps has been restricted by lack of credit facilities to allow payment over an extended period. It appears that the wish to make improvements is high but many solutions are near or beyond the reach of most rural farmers and incremental change needs to be in steps tailored better to their capacity.

### Specifications, guidelines and training

Technical training is needed to improve quality of construction and installation. Business training is required to equip local entrepreneurs with better marketing and small business management skills. At present however, piloting has not led to development of manuals nor has it led to an assessment of the cost effectiveness of different technology options. In Mali, the Ministry of Health approved well protection tends to be with lining only of the some 20-50cm at the top of the shaft by breeze blocks or stones and mortar. This may be an inadequate depth of lining, depending on the size of the apron, and is an expensive form of lining compared with small diameter concrete rings used in Zambia and some parts of Mali. These would also provide a deeper seal to prevent infiltration. Manuals should consider cost effectiveness but also take full consideration of local aspects such as availability of cement (widely available in Mali; difficult to find in Zambia) and of stones and bricks.

Systematic data on performance, costs and design options have not yet been developed by any piloting country. These are needed for going to scale. Sector professionals tend to be reluctant to reduce specifications without reliable engineering evidence. WaterAid and Ministry of Health in Zambia have shown that reinforcing is not needed for concrete rings down to 20 metres and this has also been indicated by laboratory tests. However, advisors still tend to over-specify. Guidelines for safe cost reduction are also needed for artisan level and for district administration.

### Costs

Costs vary largely from country to country and region to region. Costs depend on the availability of skilled labour, materials, and the depth to water or size of storage required. The Uganda piloting suggests that with a community contribution of 40% and lower design specification, the cost of an improved groundwater source to the State is reduced by 85%. In Mali costs of up-grading were brought down to 75-90% of conventional source improvements, and can be reduced even further. By taking the incremental household investment approach, piloting shows that unit costs can be brought down to levels which people can afford and are willing to pay. Per capita costs may still be high because there may be fewer users per unit. However, unlike the case of conventional community supplies, the unit is affordable to users. Self Supply should not be evaluated by the same economic yardsticks as communal supplies. It is comparable to saying a bicycle cost more per head than a bus without considering aspects such as sustainability, management, affordability and flexibility of use.

Figure 9 Combining Family wells with low cost irrigation



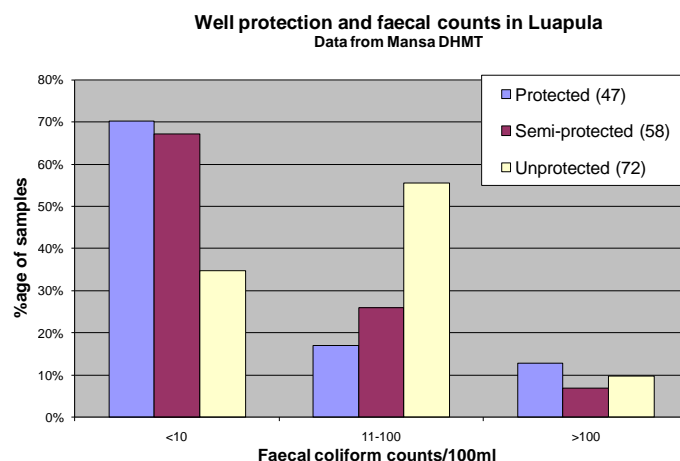
### Water quality

A major constraint to the official adoption of Self Supply as an approach is the fear that it offers a sub-standard supply and one which puts people's health at risk. This is the view of many water sector professionals who tend to idealise the performance of conventional supplies. The view within the health sector seems to be different (as found in piloting in Zambia and Mali), since health professionals tend to welcome any moves which reduce risks from those of the sources and practices which households use. As one Malian health worker said *"we do not seek perfection, we seek progress"*.

Realistically, in ten years time, many people will still be using the same traditional sources that they have now. Many people who have access to protected sources are not drinking uncontaminated water. In both cases the low cost solution is to see in what ways water quality can be improved incrementally, where outside funding is not adequate. Such improvement may be to the source and/or to the stored water in the house.

Figure 10 Monitoring of water quality,

Source: Ministry of Health, Zambia



Evidence is limited, but the three piloting studies so far do show significant water quality improvement:

- Simple up-grading appears to have led to a marked improvement in water quality in Uganda. Tillett (2007) found a 10-20-fold improvement in quality in almost all cases.
- In Zambia Ministry of Health monitoring of previously improved wells show that whilst a third of unprotected wells had less than 10 TTC/100ml, those semi-protected with a raised parapet and cover were twice as likely to fall in this range of low or no contamination.
- In Mali only one well in 35 of those which were up-graded was found to be contaminated and then only at a low level. Indications are that up-grading is not purely cosmetic but can have real impact on water quality, while retaining the convenience of a well close to the home.

Piloting also indicates that levels of contamination from low cost up-grading in Mali, and Zambia were lower than for fully lined wells equipped with handpumps in Ethiopia or Mozambique (Sutton 2008).

## Social Issues

### Sharing and payment

Initial studies and piloting highlight that water is unlike any other commodity in its value to households. In almost all circumstances in rural areas it is not regarded as having a commercial value in its own right, i.e. it is generally not for sale.

Many people have invested in their own groundwater supplies, but very few are its sole users. Almost all well-owners share water with their neighbours:

- 90% in Mali (Sutton et al 2006)
- 90% in Zambia (Munkonge and Harvey 2009)
- 75% in Uganda (Carter et al 2005)

Sharing even takes place with the wider community where the supply is closer, more reliable or perceived to be of higher quality than other sources.

Sharing is extremely rarely combined with payment (less than 15% in Zambia and Mali). Exceptions may be made mainly in peri-urban areas where electricity or fuel is used for water lifting, or when supplies begin to dry up. Even then, many well owners will not ask for recompense from others who draw water. It seems to be a fundamental belief that water is a God-given benefice, and that it is a privilege to share access with others in the community. In fact this belief is one underlying reason why payment for conventional community supplies and their maintenance is often an anathema to those who share in their use.

One constraint to the adoption of higher levels of technology in well-up-grading is that the culture of not paying for access to water means that the costs fall all on one family who traditionally cannot ask others to pay towards their costs.

Figure 11 Marketing the Rope Pump In Zambia



### Ownership and status

The value of owning a water supply is complex. There are obvious benefits such as the convenience of having a supply on the doorstep, and being able to choose to use the water for other purposes such as food processing, irrigation and animal watering. This choice is only available to the supply owner). Such uses provide indirect benefit of increased income and/or better nutrition. However, the visibility of the supply itself brings other less tangible benefits. One of these is increased status from being able to show one has adequate resources to care for one's family but also to share with the community and so to contribute to the common good.

There is usually great reluctance to give up this benefit, so that it is rare that a well-owner will ask fellow-users to contribute to maintenance or excavation, especially in cash. Contributions in labour may sometimes be accepted, but generally not any move that threatens to reduce the control a well owner has over his supply. This has major implications for organisations which wish to select the most reliable traditional wells for highly subsidised up-grading. In fact well-established management systems and the controls which go with them can be destroyed. As a Malian community remarked "**What belongs to everyone belongs to nobody**" (echoed by many others), as they bemoaned the fact that rules of good practice in water drawing and decision-making on maintenance had been almost wiped out by the move from individual ownership to community management.

### The community-household interface

Encouraging private investment in up-grading seems to appeal to many individuals and communities but it may create some strains between them. The relationship between well-owners and those sharing the supply is often complex and not well-documented. As a supply is improved more people want to use it, putting more pressure on the resource and any water-lifting device. Almost all well-owners with piloted improvements remarked on the increase in numbers of people coming to collect water. Breakdowns or drying up may become more common increasing the cost to the owner.

Encouraging others to improve to the same level is not something the owner can do, as it will appear he is grudging sharing his supply, so it becomes something only the community can

attempt. This may be through traditional leaders, development committees or other routes. Similarly where subsidies are offered for up-grading, communities may have some say as to which well-owners should have priority. So while private ownership is highly prized the relationship between owners and the surrounding community cannot be ignored and needs to be treated with care.

### Financial Issues

It has long been assumed that consumers are not able to finance supply improvements. This has been reinforced by the relatively high costs of technologies which are counted as acceptable to meet the Millennium Development Goal (MDG) targets. Piloting Self Supply indicates that this is not the case. In addition, many of those willing to invest would welcome loans to enable them to cover the costs over more time and thus proceed more rapidly up the technology ladder. Costs of improvements are a constraint which can be much reduced through savings and loan mechanisms but also through access to remittances. Access to such funds has been little developed previously, but has potential both for private and communal supplies.

### Traditional savings schemes

Most societies in sub-Saharan Africa have developed savings schemes which help people to cover expensive items or to respond to unexpected emergencies (funerals, healthcare costs, marriages etc). Many are on a revolving basis ('*tontines*') where savings group members (usually around 10-15) each pay on a monthly or weekly basis into a pool fund and each month in rotation one receives the whole fund. Some communities also have social funds to help cover unexpected costs. Such systems develop financial management capacity and funds which can be used to assist investment in water supply whether for Self Supply or communities, but the necessary links are seldom made.

Piloting in Mali involved some communities using traditional community funds to assist individuals with the most reliable

wells to make improvements which could benefit everyone. Ethiopia is also looking to see how traditional savings schemes could assist low cost technology adoption at household and community level. Some communities were found to have accessed communal funds to provide the initial community contribution or to pay for labour (Sutton 2007a).

### Loan and revolving funds

Well owners find it difficult to access rural development loans since their water supply is seldom principally for income generation and so requires higher financial guarantees. This situation can be changed by raising awareness among fund holders of the indirect economic benefits of improved supply. Establishment of revolving funds is also an option. In Zambia WaterAid is using the latter approach, introducing revolving funds which are the responsibility of the community, but available to individual well-owners in rotation (as in the '*tontines*' system). Community pressure to return the loan and make it available to the next member encourages repayment.

**Figure 12 In Uganda, group saving schemes have enabled rainwater harvesting facilities to be constructed**



**Table 3 Main Subsidy Options**

Level	Advantages	Disadvantages
1. No subsidy (Buy only what you can afford)	<ul style="list-style-type: none"> <li>■ Is not donor dependent</li> <li>■ Encourages adoption of sustainable technology levels</li> <li>■ Shows that solutions are affordable and can be copied</li> <li>■ Does not de-motivate those who would be unsuccessful in applying for grants</li> </ul>	<ul style="list-style-type: none"> <li>■ Limits those who are able to make improvements, concentrating benefit on the richer (although they usually share)</li> <li>■ Limits the level people can reach at one time</li> </ul>
2. Loans but no grants (Buy now, pay later) + deposit	<ul style="list-style-type: none"> <li>■ Increases range of those who can improve supply</li> <li>■ Allows households to reach higher levels of service more quickly</li> <li>■ Can also allow artisans etc to equip more fully</li> <li>■ Allows two season's investment at one time</li> </ul>	<ul style="list-style-type: none"> <li>■ Still limits those who can benefit</li> <li>■ May be defaulters and more opportunity for corruption</li> </ul>
3. Small incentives / part subsidy (free pulley, lid, rope pump, or cement)	<ul style="list-style-type: none"> <li>■ Low cost implication to government</li> <li>■ Helps publicity and focuses people's minds on the products</li> <li>■ '<i>Something for nothing</i>' is a good driver</li> <li>■ Depending on cost of incentive, it may help people reach a higher level (e.g. pulley or rope pump)</li> </ul>	May slow progress of people wait to be eligible for incentive or it is not always available
4. Same per capita subsidy for all, with community of Self Supply	<ul style="list-style-type: none"> <li>■ Opens up Self Supply to the greatest number of people</li> <li>■ Allows choice by communities of solutions they prefer</li> <li>■ Is equitable</li> </ul>	The reasons for Self Supply relate largely to inadequacy of funding. giving same per capita subsidy to all continues to limit significantly the numbers who can benefit

## Subsidies

A further way of supporting households is through subsidy. Table 3 shows some of the options which are available. Informal versions of small incentives (Level 3 in Table 3) have been tried in Mali and Uganda, through providing cement for well protection or rainwater storage, and/or providing payment to artisans.

Results in Uganda suggest that this approach can only work if government have adequate funds to subsidise a high proportion of supplies. If this is not so, the rate of improvement slows or halts. In Mali despite a 60% subsidy, continued promotion of the approach by the health sector and masons has meant that households have continued to copy some of the new practices in well construction and protection. However, this has been limited particularly by the lack of any micro-credit system in place. Piloting in Zambia avoids this by offering no subsidy (Level 1 in Table 3). Masons are motivated by gaining additional income from successful marketing, an ideal situation but one which it takes more time to reach.

There are cases where a government wants people to invest in their own improvements to increase coverage. This is particularly in areas where government finds it difficult to provide a service (i.e. small, remote communities or those with very scattered housing). If government provides a high subsidy to communities which are easy to cover it would appear inequitable to not provide such support for households in difficult areas. However, this is the case in Zambia at present. After initial doubts householders are accepting that the subsidy to them is actually the provision of trained artisans and pump makers. Householders are recognising that by making use of this, they are able to improve their water supplies today, rather than wait for water supply improvements which may not reach them for many years. Such realism is not easily established but results in Milenge and Nchelenge district show that it can be achieved, bringing services to difficult areas.

## Monitoring

To learn fully from what has been achieved requires systematic monitoring of the performance, impact and user satisfaction of supply improvements. A historical reality of the water supply source improvements is that funds are much more easily accessed for constructing something or even repeatedly rehabilitating it than for monitoring. Finding funds to analyse what is going wrong or to put in place support mechanisms which would reduce the need for new construction or rehabilitation is much more difficult as the outputs cannot immediately be counted. In the case of piloting, recording what is done is essential for lessons to be learnt and best practices to be adopted. There is need to collect information on performance, costs, user satisfaction, equity, water quality, the spread of ideas through copying what others are seen to have done and private sector growth. UNICEF Zambia has a documentation strategy in place and Self Supply in Uganda has been the focus of many MSc theses. As the systematic monitoring of these aspects is still lacking, it is not yet possible to fully understand the outcomes and impact of the self Supply piloting

**Figure 13 Charging Batteries brings in additional income to invest in family well improvements.**



## Conclusions

Self Supply in the form of household investments in water sources is widespread. The value of Self Supply is that it is owned and managed privately, but generally acts as a small community supply.

Piloting in Zambia, Uganda and Mali show that self supply can be accelerated. With successive incremental improvements, rural dwellers can ultimately have access to levels of service which can be officially counted as an improved or safe water supply. These water supplies can thus contribute towards the Millennium Development Goal targets and be considered as coverage under the definitions set by the Joint Monitoring Programme. The self supply approach has proved particularly relevant to sparsely populated areas and those with easily available groundwater or rainwater.

It is very important to note that the process of acceleration does not refer to specific technologies or levels of service. Rather the process of accelerating Self Supply involves establishing an enabling environment consisting of the four pillars of technology and technical advice, a strong private sector, access to finance and supportive policies. The experiences from piloting indicate that if any one of these pillars is missing, rates of acceleration diminish.

The introduction of an approach to accelerate self supply needs to be flexible enough to fit in with different policies, economic conditions and physical context as well as the local culture and the ideas of key sector personnel. What is right for one country or institution is not necessarily right for all.

**Figure 14 A family well for drinking water, laundry, gardening and many other uses**



It is important to see Self Supply acceleration not as achieving specific targets for access to a safe water supply, but rather as the strengthening of support services. In other words, local organisations and institutions are given the capacity to advise individuals and communities in:

- The steps they can take to reduce risks incrementally.
- Access to loans or revolving funds.
- Linkages between sanitation and water supply improvements.

Local organisations and institutions can also be involved in the training of private sector and district offices. These additional support services have small cost implications but can pay big dividends over time both in terms of sustainability and coverage for all supplies.

In order to introduce the concept of self supply, an assessment of the potential has proved a good interactive start. This has enabled stakeholders to understand the concept and identified barriers to change. Piloting in the form of demonstration (including subsidised solutions) may speed up the early stages of acceptability, but can prove difficult to move to a larger scale. At some stage a change in thinking to increased self reliance is necessary. This is the biggest hurdle to overcome and takes time to achieve. Deciding on the best way and timing for this transition is the key to a successful strategy for accelerating Self Supply.

The experiences in the four countries which are piloting Self Supply have highlighted three major barriers to change.

- There is a lack of data on the performance of conventional water supplies (e.g. user satisfaction, functionality and water quality). This makes comparisons with Self Supply sources difficult.
- Self Supply acceleration sits uncomfortably with existing planning processes as the outputs are not as predictable as when external organisations build infrastructure.
- Guidelines on cost reduction for family level investment and incremental improvement of supplies to small groups are still largely missing. This is slowing down progress in all focal countries and the introduction of the approach to new ones.

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## Cover pictures

- Bottom left: Brick-lined traditional well (Zambia) with locally made windlass - Mr Chileshe supplies all his domestic water needs from the improved well and tripled his production of cabbages for sale with easier access to water.
- Top Left: Moussa Traore (Niger) shares water from a well and rope pump with his neighbours
- Right: Abdurahman Zongo (Ghana) dug a well to provide water for his house and the guests in his hostel. His trade increased so much that he obtained a loan to install a submersible pump and then elevated storage. Now a lady caretaker sells the water to in the neighbourhood. He is now planning to sell water through house connections. From small seeds a water company can grow!

## About the author

Dr. Sally Sutton coordinates the RWSN Self Supply Flagship. She has more than 30 years of experience in rural water supply, including practical hydrogeology, planning, evaluation, systems and policy development. A major interest is in helping to bridge the gaps which often exist between end-users and policy-makers so that consumers have informed access to a wider range of options which reflect their concerns and values.

The photographs used in this document were taken by Sally Sutton. The document was reviewed by Kerstin Danert, of the RWSN Secretariat (Skat Foundation) and Peter Harvey (UNICEF).

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## Support

In **Ethiopia**, the Ethiopian Government at Federal and Regional level are involved in the implementation of accelerating Self Supply.

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In **Uganda**, the Ministry of Water and Environment, the Uganda Water and Sanitation NGO Network (UWASNET), the Uganda Rainwater Harvesting Association (URWA), WaterAid, the Uganda Muslim Rural Development Association (UMURDA), Wera Development Association (WEDA), Kigezi Diocese Water and Sanitation Programme and the Agency for Cooperation and Research in Development (ACORD) have all been involved in demonstrating and piloting either domestic roofwater harvesting or groundwater source improvements for households or both.

In **Zambia** UNICEF, WaterAid, Development Aid from People to People (DAPP) the Ministry of Health, the Ministry of Local Government and Housing, and District Local Governments in Nchelenge, Chiengwe and Mansa districts, Luapula are involved in the implementation of the self supply piloting.

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