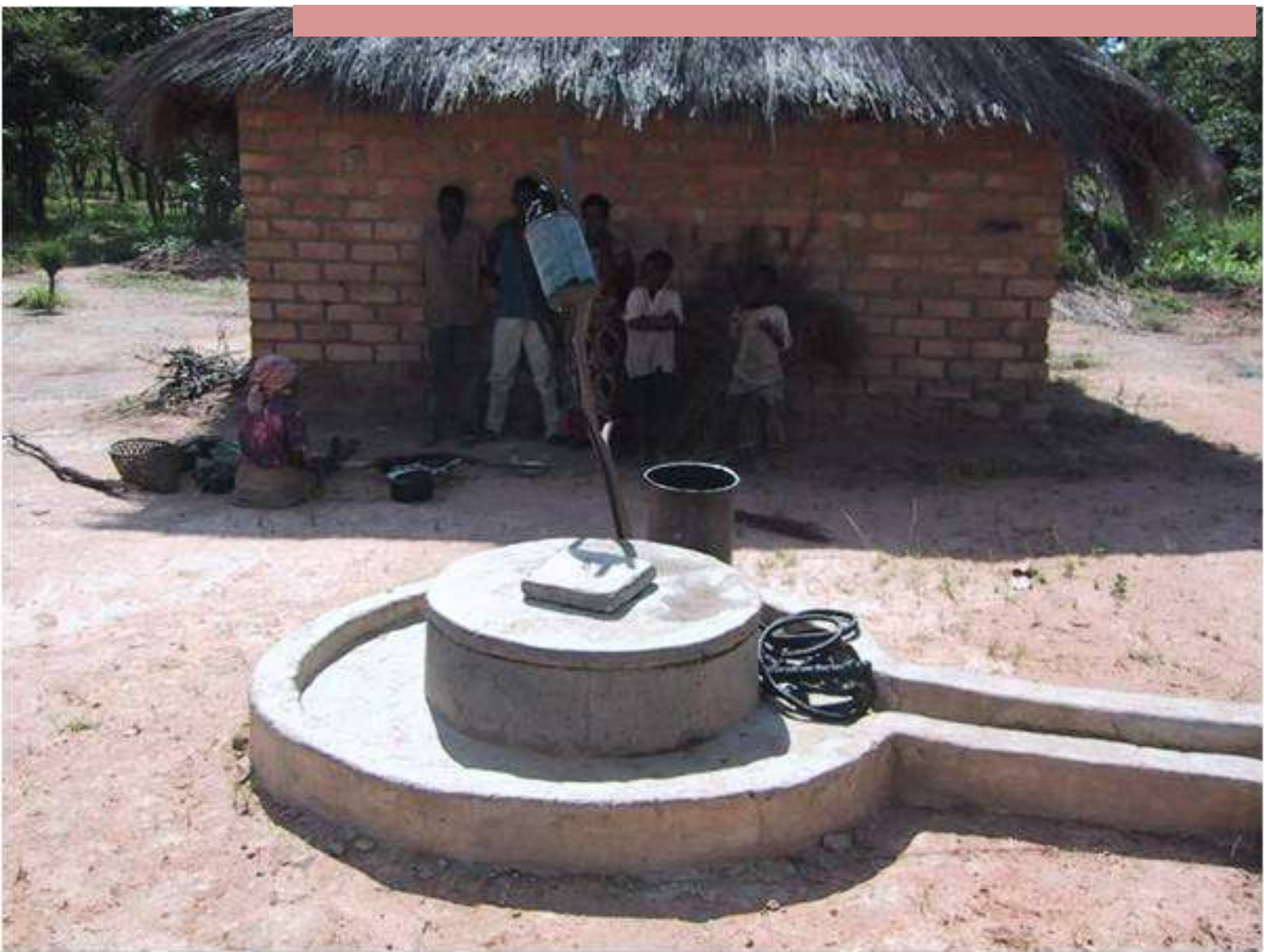




# Accelerating Self Supply

A Case Study from Zambia



## Executive Summary

Zambia has a very low density rural population, which makes the establishment of sustainable community water supplies a particular challenge. Previous piloting of improvements to traditional water sources showed both a demand for and an impact from low cost up-grading (Sutton 2002). UNICEF, with RWSN technical support, has been encouraging improvements to water supplies in some of the poorest districts of Luapula Province. Remarkably, these have been achieved with zero subsidy. All hardware costs (labour and materials) are covered by householders; the donor input being only in capacity building through training and marketing.

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## Abbreviations and Definitions

ACOs	Area Community Organizers
ADC	Area Development Committees (now sometimes called Ward DCs)
DAPP	Development Aid from People to People
D-WASHE	District Water, Sanitation and Health Education Committee
EWB	Engineers without Borders
HWTS	Household Water Treatment and Storage
JICA	Japan International Cooperation Agency
MDG	Millennium Development Goal
MEWD	Ministry of Energy and Water Development
MLGH	Ministry of Local Government and Housing
MOH	Ministry of Health
NHMC	Neighbourhood Health Management Committee
UNICEF	United Nations Children's Fund
VWASHE	Village Water, Sanitation and hygiene Committee
WDC	Ward Development Committee

Conventional community supply refers to heavily subsidised water supply services which are implemented by Governments and NGOs and then managed by communities.

## 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.

Supplies that have been improved with household investment tend to be more effectively managed and maintained. They are particularly relevant in small or remote communities, and where there is easy access to groundwater or plentiful rainwater. In such conditions conventional community supplies (see abbreviations/definitions) tend to offer high per capita costs combined with low sustainability, and so often lead to low coverage.

Under the Self Supply flagship, the Rural Water Supply Network (RWSN) is encouraging authorities, NGOs and the private sector to recognize 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 and the constraints which they face in achieving their aims.

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

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

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 taking the self supply approach to scale.

This report is the second in a set of five. Four of these reports present progress in countries (Ethiopia, Mali, Uganda and Zambia) which have been piloting Self Supply. The fifth report draws together the lessons from these projects.

## Country Context

### Geography, Geology and Population

Zambia is a land-locked country, with an area of some three quarters of a million square kilometres. About 7% is arable. Although there is relatively little irrigated agriculture, there are almost 10,000 km<sup>2</sup> of open water, notably the plentiful swamp lands and lakes of the North and of Lake Kariba and the Zambezi River to the South.



**Figure 1 Map of Zambia**

The annual rainfall in Zambia decreases from an average of 1,200 mm in the north to an average of 600 mm in the south (FAO 2006). A major environmental problem reportedly faced by Zambia is deforestation, which has a particular impact on the regulation of much of the catchment area of the Zambezi River. Authorities agree that small-scale agricultural practices are the largest contributor to loss of forests (NFU/GART 2010).

The most dependable aquifers are the alluvial deposits along the main rivers (Zambezi, Luangwa, Kafue and Luapula) and around the lakes, and the wind-blown Kalahari sands covering the west and north-west (BGS 2001). Zambia's geology is dominated by crystalline rocks, although there are also sedimentary formations (BGS 2001). There has been a steady increase in the used of groundwater in Zambia, which provided some 9% of water use in 2001 (BGS 2001).

It is estimated that only 1.5% of the annual renewable water resources are being used at present. There are significant regional differences across the country with regard to place and time when water is available, and groundwater availability is unevenly distributed (Sievers 2006).

Zambia has a total population of 12 million (CIA 2009). The rural population of about 8 million is sparsely scattered with an average population density of around 10/km<sup>2</sup>.

The main commercial livestock areas are Southern province, Central province, Lusaka province, Copperbelt province and the Eastern province, and large numbers of cattle are found under small cattle farms particularly in the Southern and Western provinces (FAO 2006). Cattle production in certain regions is limited by trypanosomiasis, carried by the tsetse fly.

### Economics

Levels of poverty are high and Zambia is ranked 164 out of 182 in the Human Development Index (HDI) (UNDP 2009). The ranking is slightly higher than many other sub-Saharan African countries partly due to the fact that the economy is largely based on mining, with a relatively large salaried urban population in the Copper Belt and Lusaka (35%). The economy is very dependent on the price of copper.

The relatively high level of urbanisation also means that food production depends on a relatively small and mainly subsistence farming sector. A high proportion of the population (some 67%) live in extreme poverty (UNDP 2008). Rural dwellers account for 65% of the population, and are highly dependent on rain-fed agriculture, which is often affected by drought (especially in the South) and floods (in the Zambezi river valley).

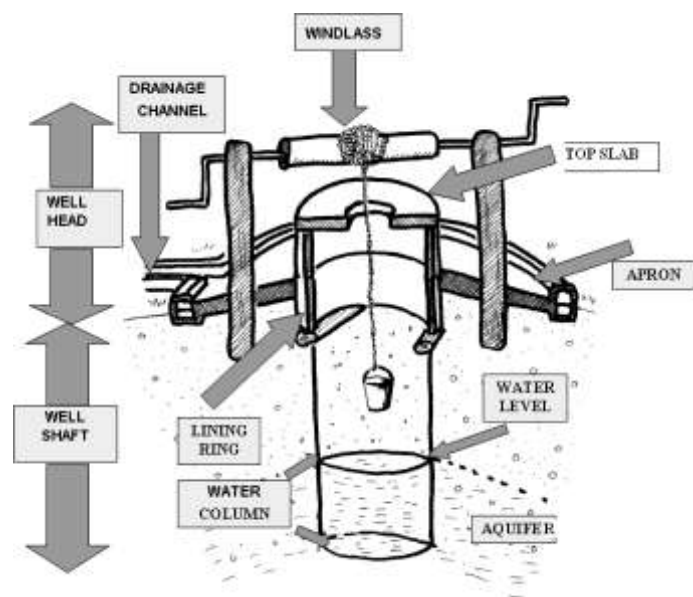
### Rural Water Supply

The level of rural water coverage in 2008 in Zambia was 46% (UNICEF/WHO 2010) with an MDG target of 75% by 2015. It should be noted that the Demographic Health Survey (DHS) of 2007 estimates that the water coverage figure is even lower, with only 20% of the rural population having access to an improved source.

Progress to increase coverage has been slow, averaging 1.3% per year since 1990 (UNICEF/WHO 2010). It is necessary to increase the number of people gaining access to rural water annually by a factor of 6 if the MDG is to be met (WSP 2006).

Widespread handpump rehabilitation has accompanied new borehole construction programmes but keeping the systems operational has been a major challenge. An estimated 32% are not working despite so many replacements (Harvey 2009). More than half of the rural water coverage is provided by large diameter lined hand-dug wells. However boreholes are now the favoured option by Government. National policy is to provide a handpump for every 250 people and small piped supplies for populations of 2000. Up-graded traditional wells, with at least partial lining (e.g. Figure 2), are included in the statistics as a suitable level of service for scattered households.

**Figure 2 Up-graded Family well: National standard has a top slab but not always a windlass**



Most of Zambia’s nine provinces have had major donor funded water and sanitation projects, with Germany (KfW), Japan (JICA), Norway, Denmark, the Netherlands and Ireland putting resources into specific provinces over more than a 20 year period. This has also been aided by UNICEF and many NGOs (including WaterAid, Oxfam and World Vision). Zambia is now progressing towards a Sector-Wide Approach to Planning (SWAP) but bilateral donor interests still remain largely focussed on particular provinces. Luapula Province in the North has the lowest served population since no donor projects have been in place there until recently. JICA are now drilling some boreholes and AfDB are starting to support activities in two districts of the province. Their plans will slightly increase coverage.

**Traditional Wells and Rainwater Harvesting**

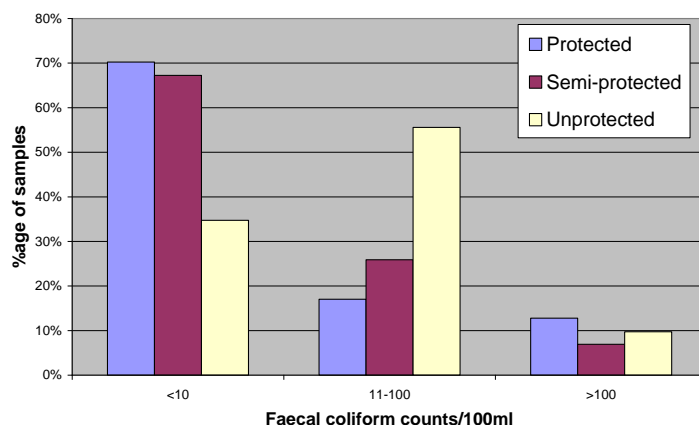
In areas where groundwater is relatively shallow and water levels do not fluctuate too wildly, many families have dug their own wells (e.g. Figure 4). This applies mostly to North-Western, Northern and Luapula provinces. In the Western and North-Western provinces shallow scoop-holes are also common, since the instability of the Kalahari sands makes it difficult to dig reliable unlined wells. Rainwater harvesting is not common even in areas of reliable rainfall, because over 80% of houses have grass roofs (DHS 2007). Traditional hand dug wells are less relevant in the central and southern parts of the country where groundwater tends to be at greater depth (Sutton 2002). This is also unfortunately the area where rainwater harvesting has least potential, offering little scope for Self Supply except in household water treatment.

No systematic survey of private family wells has been undertaken in Zambia. A national inventory taken in 1995 recorded some private wells but it appears many more were not counted. For example, in Luapula province the inventory recorded some 6,000 private wells which may be a fraction of the total. In 2007 the Ministry of Health recorded over 7,000 private wells in just one of the seven districts (Mansa) of the Luapula province and even then regarded the survey as incomplete. These 7,000 wells represent one private well for every five households indicating a high demand for, and dependence on family wells.

**The Potential of Self Supply**

From 1997-2001 a Department for International Development (DFID)-funded research project explored the potential for community-led up-grading of traditional water sources in the four provinces of Western, North-Western, Luapula and Northern (Sutton, 2002). Working with the Ministry of Health and Department of Water Affairs the project identified a high potential for up-grading traditional wells by householders themselves, i.e. Self Supply. It found a high demand from end-users, increased productive use and also a significant improvement in water

**Well protection and faecal counts in Luapula**



quality in the wet season with low cost up-grading (Figure 3).

**Figure 3 Water Quality Results (Ministry of Health, Mansa 2008 data)**

*Protected = raised parapet, top slab, cover, apron, drainage (and usually windlass).*

*Semi-protected = raised parapet, cover, no apron.*

*Unprotected = no parapet, cover.*

However, with the sector reforms the responsibility for rural water supply changed from the Department of Water Affairs in the Ministry of Energy and Water Development to the Department for Infrastructure and Support Services in the Ministry of Local Government and Housing. This meant that much of the momentum generated in the research project was lost. However the Ministry of Health has continued to promote the Self Supply Approach.

## Overview of the Self Supply Piloting

The present initiative to explore Self Supply potential and accelerate its progress, started towards the end of 2007, and concentrated on Luapula province. This area was selected due to its high un-served population and suitable hydrogeological conditions. In some districts, less than 10% of the population are considered as served with an improved water supply. In addition the convenience many houses find in having their own supply, or sharing with a close neighbour, coupled with a wide scattering of houses means that conventional community water supplies have proved difficult to establish and maintain.

### Objectives

The Ministry of Local Government and Housing (MLGH) has developed a Rural Water Supply Strategy which includes a three-year period for area-based projects to field test strategies and establish tools for large scale implementation. In line with this, the general objective of the self supply piloting undertaken by UNICEF with MLGH approval is *'to develop a Self Supply package in two (now four) districts which can be shown to contribute significantly to improved water supply and poverty reduction by 2010'*.

### Key Actors

Since 2007 UNICEF Zambia has been leading the new initiative to pilot Self Supply and monitor the results. UNICEF has established links with WaterAid and Development Aid from People to People (DAPP), the NGOs which are organising implementation on the ground. UNICEF is also in close contact with MLGH to ensure their involvement in the process.

UNICEF is setting Terms of Reference for implementation, monitoring and documenting the progress and assisting MLGH with national workshops/progress meetings as well as disseminating information (UNICEF 2009). UNICEF is also arranging exchange visits, presentations at international conferences (Munkonge, and Harvey 2009) and links especially to Ethiopian self supply initiatives.

The Ministry of Health, especially the Environmental Health Division, is involved at national level in discussions. It plans to monitor aspects such as the up-take and conformity of household water treatment and safe storage (HWTS). At community level, the Environmental Health Technicians (Environmental Health Technicians) promote well up-grading and HWTS and train community health workers and Neighbourhood Health Management Committees in the principles of water supply up-grading. In Milenge district Environmental Health Technicians have also been trained and equipped for water quality monitoring.

Local Ward Development Committees and WASH committees form a vital link between the district and community levels. They choose artisans for training and areas for piloting based on their local knowledge. They also control revolving funds.

There are very few NGOs working in Luapula province. As already mentioned WaterAid and DAPP are the main implementers. Engineers without Borders (EWB) provided an engineer over a period of about 18 months to help the WaterAid coordinator and specifically to document the process as it develops.

The role of the Rural Water Supply Network (RWSN) has been to:

- Provide technical assistance to initiate the process, based on previous research.
- Develop the implementation plan.
- Help to monitor progress and assess the documentation strategy.
- Provide technical support to UNICEF.
- Ensure international promotion of the findings and wider debate.

### Approaches Used

UNICEF and the implementing NGOs are following an approach of zero-subsidy to end-users for technology improvements, even in the demonstration phase. All funds are therefore concentrated on activities which build up the four pillars of:

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

These are considered to be the foundation of a package which can create an enabling environment for households to choose and implement their own water supply improvements. In order to establish these pillars, a four-stage process is being followed as described below.

#### Stage 1 Introduction of the Idea

The process of introducing the idea began with joint planning meetings in Milenge, Nchelenge, Chienge and Mansa districts in November 2007, where the Self Supply Approach and Implementation Plan (Sutton, 2007) were discussed. The District Water, Sanitation and Health Education Committee (D-WASHE) and district council members worked out what could be achieved by partner organisations and made budget estimates for UNICEF. Thus, District councils have been involved from the start.

UNICEF entered into a Partnership Cooperation Agreement (PCA) with WaterAid to pilot Self Supply in Milenge district with DAPP in Nchelenge and Chienge districts, and, more recently with the district council in Mansa. By working with different partners, UNICEF is exploring different models of introducing the Self Supply Approach.

The NGOs carried out situation analysis surveys to understand what exists (baseline situation), establish the potential for the Self Supply Approach and help with planning (UNICEF/DAPP 2009; Burrow and Mbawo 2008). The main findings were:

- Family wells are very common and few have much protection, beyond being covered.
- Water abstraction is generally by rope and container (plastic or metal cooking oil cans).
- Most traditional sources are within 250m of a handpump and within 25m of houses.
- Water quality data was not very reliable but suggests 50% of sources with 0-8 FC/100ml and 83% with <50. This compares with results of the previous piloting which had 61% with 0 FC/100ml and 82% with less than 10 FC/100ml (Sutton 2002).
- 90% of wells are privately owned and are mostly used for all domestic and other purposes (including drinking water).
- Most wells are maintained by the owners, only in about 15% of cases did those sharing the water contribute labour or cash.
- The preferred improvement for wells expressed by owners, was for a better lifting device.

**Figure 4 Typical traditional Well in Luapula Province: even**



**small changes can bring improvement in water quality**

With the information from the surveys the NGOs have introduced the idea at district, selected ward and community levels. The NGOs have raised awareness of what people can do for themselves, especially in the scattered small villages which are common. They have involved extension workers in health and agriculture as well as the WASH and development committees at sub-district and community levels. Thus there has been wide discussion and considerable interest among practitioners working on the ground and rural dwellers who see a high relevance of this approach to their circumstances.

## Stage 2 Demonstrating what can be done

Both WaterAid and DAPP have built up sub-district level expertise through training programmes. This phase has been tackled in different ways by the two NGOs.

**WaterAid** have developed a cadre of artisans (e.g. Figure 5) who are now skilled in sanplat and latrine making and well protection, especially in lining. They have been trained in metal work, masonry and welding to give them wider skills which will be required as technology levels change. They have also been trained in working as a team and on the promotion of their skills and household water treatment and safe storage (HWTS) as well as on marketing.

WaterAid have also worked with neighbourhood health management committees and other government sub-district level groups to encourage their support to well-owners and artisans. This has been achieved by either having one person placed in the council or having them work independently, since the council offices are very far from the areas of interest (300km).

The artisans are the main promoters, as their income is largely dependent on selling their skills. They talk to village groups and then householders contact them and ask for their advice and estimates of costs. There are four trained artisans per ward, and they tend to work as a team when a job arises, rather than each working in his own area.

Well-owners pay for everything, from materials through to artisans' time. They are particularly interested in concrete rings for well lining (Figure 9) as much of the district is underlain by poorly consolidated sediments at depth. As there have been no traditional lining methods up to now, at present much of the well-owners' time is spent cleaning out collapses or digging replacement wells.

**Figure 5 Some WaterAid-Trained Artisans of Milenge**



**DAPP** have two district coordinators (working half-time on the Self Supply piloting) and a team of nine local Area Community Organisers (ACOs). The ACOs, which include community health workers, were initially trained for promotion of hygiene and sanitation and work partly as volunteers.

Local artisans have been trained in Sanplat production but not well protection. However the ACOs have developed principles of well protection and linked them to low cost/no cost traditional materials, techniques and behaviour change.

### Stage 3 Increasing self-reliance

As there is no subsidy to end-users, demonstration can fairly seamlessly merge into a less donor-dependent phase in the areas where demonstration has been undertaken. Both of the implementing NGOs are setting up systems which build on self-reliance and thus minimise donor dependency after the initial preparation and training of stakeholders.

However, DAPP are introducing parallel lines of communication to those supported by government, which is likely to be less sustainable. WaterAid is pioneering the operation of revolving funds. These would allow a wider range of people to improve their supplies and enable individuals to make a greater step towards improvement than they could make otherwise. Local WASH committees combine with Neighbourhood Health Management Committees (NHMCs) to run the fund, and have been given training in the principles of fund management.

### Stage 4 Going to scale

So far the approach has only been tested in relatively small areas (a few ward units of about 10,000 people each). Going to scale on a wider basis will require further inputs and districts to embed Self Supply Approaches into their plans and budgets.

Mansa district has included activities into their budget to encourage Self Supply, particularly within health, but this is still for the piloting stage. However with its inclusion from so early in the process, it should be less of a challenge for Self Supply Approaches to be included for the whole district at a later stage. Being also the district which includes the provincial capital means that provincial stakeholders have been included in discussions. Wider dissemination of the idea and up-take at higher administrative levels should thus be easier.

The involvement of national level Ministry of Local Government in monitoring the progress and as instigators of national workshops also helps Self Supply Approaches to be considered within policy. As mentioned earlier, improved traditional sources are already included as a level of service for scattered households in the Rural Water Supply and Sanitation (RWSS) strategy.

## Technologies Promoted

### Wellhead Protection

DAPP is promoting traditional improvements to wells on the principles of progressive risk reduction. These include:

- A raised lip, drum or bottomless bucket protecting the top of the well and sealing it from surface inflow.
- A mound around the mouth of the well to avoid ponding of water and seepage back in. The mound may be covered in clay to reduce infiltration (Figure 10).
- A lid to close the well opening and protect it from wind-blown debris and items or animals falling in (Figure 6).
- A single rope and bucket used by all (cover photo).

**Figure 6 Protected Well in Nchelenge using local materials, and with clean storage of rope and bucket**



- An old basin to hold the rope and bucket and keep them clean during storage and while drawing water.
- A roof to keep the rain out and the area around the well dry (Figure 6 and Figure 7).
- A fence to keep out animals.
- A stand for bucket filling and associated drainage to take away spilled water.
- Strong ownership to ensure that rules on water drawing and site hygiene are followed.

DAPP is also establishing production of rope pumps in Nchelenge with a local mechanic (Figure 8). After limited piloting, including demonstration, pumps would be bought at full cost by the well owners. However, micro-credit will be necessary to get this started. WaterAid is also setting up pump production at Mansa Trades Training Institute.

**Figure 7 Full set of elements for protection including clay-sealed mound and stand for buckets.**



### Well Lining

In many parts of Nchelenge and almost all parts of Milenge, well shafts are prone to collapse at or below the water table. WaterAid is training artisans in the manufacture and installation of well rings (Figure 9).

The well rings are of small diameter and without reinforcement to minimise cost and avoid over-design for the shallow wells. There are three easily transportable glass fibre ring moulds for each group of four masons. The masons have also each been provided with a shovel, pointing trowel, spade and protective clothing including helmet (Figure 5).

**Figure 8 Rope Pump Prototype in Nchelenge**



### Household water treatment and Safe Storage

Household Water Treatment is already well-established in the lakeside areas of Nchelenge and Chiengwe. Promotion of chlorination has apparently been high in these cholera-prone areas. Unfortunately there is no hard data to support this. Neither is it known whether recent promotion by Environmental Health Technicians has increased the number of households treating water or the regularity or reliability of treatment. In Milenge uptake is said to be less than 10% but this is also not based on hard data.

### Results of the Piloting

The time since introduction of the Self Supply Approach and the artisan training has been the season of highest water levels and greatest agricultural activity. It also coincided with the period before the harvest when household cash flow is at its lowest. This is the time when householders are at their busiest, with least cash and unable to undertake works on the well shaft.

Despite this reality, no subsidies were given as incentives for any demonstration activities. Any improvements to water supply that have already been achieved therefore indicate a very strong interest by the households. Adding in the fact that these districts are some of the poorest in Zambia and that the rural population is on average poorer than those in the other piloting countries, then the response of households here is even more remarkable.

### Numerical outputs- DAPP in Chiengwe and Nchelenge

In the northern districts (Chiengwe and Nchelenge), some 60 wellheads in 15 villages have been improved with local materials. Many others have copied the principles bit by bit. Thus, in one village with 17 wells, four households have completed all the elements of up-grading; six have undertaken 80% and two are at 40% completion. Those households digging new wells are also following the 'ladder' (see Figure 10). As a result of the pride taken in the finished product, the clay-smeared mounds are being re-coated every month (see Figure 10).

Encouraging these changes is the work of one community health worker who is an Area Community Organiser (ACO). However, others have applied the same principles, if not in such a complete and attractive form. In addition, five rope pumps, for demonstration purposes, have been installed in each of the two districts.

### Numerical outputs - WaterAid in Milenge

WaterAid have put most efforts so far into artisan training and community preparation. The numerical outputs are more in the following:

- 16 mason artisans who have undertaken two separate one month courses at Mansa Trades Training Institute;



- In the four zones in which Rural Health Centers, Neighbourhood Health Management Committees, Area Development Committees (now sometimes called Ward DCs) and Village Water, Sanitation and Health Education (V-WASHE) are situated, committees now work together with masons to make plans and solve problems

In those zones there are 117 wells, from which 96 well owners have expressed a wish to improve their supplies. No wells could be worked on by June 2009 (last visit by author) as the water levels were too high. Despite this people have begun asking the masons to make them rings on site so that they are ready for when water levels fall (e.g. Box 1).

#### Box 1 Example of Motivation for Well Up-grading

*"I drink from the stream because the well water is dirty. I plan to put in rings and stop collapse so I can drink [my well water]. I chlorinate my water when I can afford to, but the stream is cloudy in the rains. The well is much nearer my house. The artisans came and talked to the community about improving our wells. Before I did not have any idea what I could do. I asked the mason to come to my home and tell me what he could do.*

*I was amazed after the first ring was made – so many people came to look. I think at least 15 out of the 20 [owners of the] nearest wells will make rings this year."*

Quotes from Sila Mumba March 2009

#### Water quality

Wells have only just begun to be improved and baseline data with respect to water quality has not been collected. However the Ministry of Health have been monitoring some of the wells which they improved in the period 2001-2006, and they plan to do the same through the Rural Health Centres in areas where piloting is taking place.

The results from over 200 samples suggest some improvement in quality with up-grading, especially in the mid-range of contamination (Figure 2). The data suggests that it is the lowest steps of improvement (the first three listed under the section *wellhead protection* on page 7) which made the most difference.

The 10% or so with more than 100 FC/100ml seem difficult to shift and may reflect aquifer contamination (latrines) or very poor abstraction practice. Hopefully more data will become available from the monitoring of the piloting to validate these preliminary findings and to identify which steps have the most significant effect.

Previous studies of household water quality in Zambia, have shown little further contamination of water during collection and storage (Mubiana and Sutton 1989, Sutton 2002), suggesting that improvements at source mostly carry through to point of consumption.

#### Costs and materials

One major drawback in Milenge has been the lack of cement and the need to bring it from Mansa, to which there is only a dirt road that is impassable after rain. However a trader has now started to stock cement locally, partly in response to the demand from the masons. This private sector response to the demand generated by a growing interest in Self Supply is a significant change. It reduces the price and the difficulties of access to cement stocks. At the same time WaterAid's experience of omitting reinforcing from rings further reduces the cost of concrete lining. Some households have therefore been able to contract as many as six rings or more at a time. The total cost of these six rings is about \$75.

Figure 9 Making Concrete Rings in Milenge



The 'traditional' improvements which have been made in the northern districts has been done at very low cost. Rope and bucket are already available and the plastic basins used for storage are usually split and therefore regarded as waste. Cost is in wood for lids and shaft mouth protection and amounts to about \$5.

#### Increased self-reliance

Progression from demonstration to wider uptake is not so difficult where people are already covering all the implementation costs. The piloting shows that it is possible to make the big shift from:

- a) The conventional approach whereby NGOs or Government decide on technologies, management and financial options and cover 95% of the cost for the community **to**
- b) Facilitating people to define and solve their own problems and pay for the solutions themselves.

Initially the rural dwellers in Milenge asked: "so what are you bringing us?" They were not receptive to the idea that all that was being brought was expertise. Then one man decided that

he would buy three small tins of cement and make one ring, getting a friend to bring the cement from Mansa. Quickly the others saw how his situation changed (Box 1). Immediately his next door neighbour commissioned six rings.

Subsequently a man 2 km away who had no well asked the masons to make 18 rings for him so he could make a well where previously it had been impossible because the ground was unstable. Thus, the idea grew and people saw new opportunities. The response has shown that there is a surprising capacity for innovative ways of raising capital and the scale of what people now feel they can achieve.

### Box 2 Achieving major improvements in steps

*"I can afford to make the rings for my well, what I need is a loan so I can install a solar pump, and someone to advise me which pump to choose."* Householder, Milenge

## Synthesis of Key Issues

### Technical issues

#### Rope pump introduction

Rope pump production is being introduced in different ways in Milenge and the in two northern districts. In one case it is with a small entrepreneur, in the other case it is with a teaching college whose staff would like to be able to gain additional income.

The entrepreneur is more experienced in costing production and allowing for fluctuations in the price of metal. The teaching college could make more design modifications, but to a large extent these have already been tried during the long history of rope pump development.

The initial market for the rope pump may be small (especially if no loans are available), so it might be better to consider one outlet to start with and then to expand if demand merited it. One trained producer (in Chienge) has already dropped out because he did not see sufficient market. The process of innovation and introducing a new technology needs to be carefully assessed to avoid rejection of something for which there might otherwise be good demand.

#### Impact

Some well upgrading improvements have been completed in full, others in part. Many more already exist or have been done by well-owners adopting all or some of the features demonstrated. To date there is no monitoring and systematic analysis of what impact these changes have made, or of how the idea is spreading. Monitoring of water quality, user satisfaction, water use and purposes of use, social status and economic benefits is required. Without such information marketing the concept at all levels from policy maker to household is very difficult. The limited data from Zambia suggests a positive effect of up-grading

on water quality, but more relevant and reliable evidence of effectiveness is needed.

**Figure 10 New wells are being constructed with basic elements of protection, starting with the mound, parapet and roof, plus safety of the rope and bucket**



### Planning issues

#### Fitting in with community supplies

Shortly after the sensitisation of communities for the Self Supply piloting, JICA moved into the area with a drilling rig. Not all communities will be covered by the JICA project and not all houses will be near enough to the new boreholes. However there is a tendency for the people to believe that all their problems will be solved for them. Unrealistic expectation is easily generated in an area where almost no drilling has been undertaken in 20 years, even though the new wells will only serve some 2% of the population. Temporarily, this threatens the budding search for self dependence offered by the Self Supply Approach.

Initially the communities to be targeted for Self Supply promotion were separated from those to be targeted by the drilling programme. This was to avoid conflicting messages. However, drilling plans have changed which has led to some confusion at community level. The possible advent of a community borehole de-motivates people from investing in their own water supplies, at least in the short term. Although as already noted, many people end up constructing a private supply near a communal supply later on.

For the artisans, the supporting committees and the traders the loss of trade and customer interest in the short term can demotivate. Planners need to be very clear where new community supplies will be placed, and ensure that those who will not be served in the foreseeable future are well aware of this reality and are offered advice on alternative paths to take.

The capacity built up at sub-district level for Self Supply and sanitation could be further sustained if it can also be used in the

maintenance of conventional supplies. The trained cadre of artisans could also contribute to participatory WASH planning at a sub-district level within the Sustainable Operation and Maintenance Project (SOMAP).

### Going to scale and new areas

Much of what has been done seems only to be known by those closely involved. Since the Self Supply concept is most easily understood by seeing it on the ground, exchange visits within the province and beyond could have a big effect. Talking to the well owners and the committees gives a much better picture of what they have achieved and how, than any written report can do. Seeing is believing!

Other Districts or Wards considering the inclusion of Self Supply should be encouraged to visit and experience the enthusiasm and remarkable initiative people are showing, rather than just having the concept explained to them. One aim of the piloting is to make the concept more easily understood. The results in Luapula make this possible.

### Policy issues

#### Coverage Data and Self Supply

At present the Government of Zambia includes improved traditional sources as an improved level of supply for statistical purposes. The definition states that they should have an apron, drainage, top lining, cover and preferably a windlass or pump (Figure 2). A simple scoring system (modified from standard sanitary inspection) could categorise 'improved', measure progressive improvement and establish what minimum standards have the most effect on water quality.

#### Strategies for those who are not served with improved water supplies or that are difficult to serve

This piloting phase is expensive as it contains a research element and learns from trial and error. If a Self Supply Approach is to become part of the Rural Water Supply and Sanitation strategy it needs to fit into government extension services budgets, plans and training. This would provide maximum sustainability and minimum donor dependence. If it is accepted that conventional community supplies cannot reach everyone then strategic investments, such as through the promotion of self supply will be required to ensure that those currently 'un-served' have some opportunities to make improvements to their existing water supplies.

#### Subsidies

It does appear that even among the poorest communities householders are prepared to make considerable investment in their own supply, even without financial incentives or subsidies. Ensuring that this change in attitude is established takes time and is vulnerable to initiatives which continue to operate in the 'giving' mode. Achieving a balance that enables the poor to make improvements without undermining local initiatives requires fundamental changes in the way that supplies are fi-

nanced or subsidised. Such changes may include better links between capital costs, community contribution and running costs, in order to improve sustainability and give wider choice. Social and financial issues

### Micro-finance

A widespread request from rural dwellers is to have access to micro-credit. This was voiced especially in the period before harvest, when cash is very hard to come by. Individuals are impatient to make improvements and want to get as far as they can as quickly as they can. They are prepared to take the responsibility for payment but do not have available cash. The solution they propose is that a revolving fund is made available for a community and that individuals would borrow from it. The community would stand as guarantor for the fund, as the borrower is known to all. Others will be waiting to take up the fund as it is returned. The pressure to re-pay would therefore be high.

### Ownership

The urge to possess a water supply for one's own family is strong. Ownership brings with it personal aspirations and social obligations which include sharing. Sharing however does not usually require any compensation to the owner, tending to be inclusive for all members of the community, rich and poor alike. In the case of multiple sources grouping will tend to be along extended family lines, but with grouping flexible when some wells dry up. Exclusion is rare since no owner wants to create enemies in a small closed community, but most well owners prefer to cover all capital and recurrent costs themselves so as to retain full ownership and control. This applies also to the responsibility to borrow money for further improvements. It also leads to pride and a wish to copy or improve on what the neighbour does. Such feelings can lead to widespread replication of improvements even where there is no subsidy.

### Conclusion

People in Luapula are used to having choices made for them and solutions provided by external organisations such as Government. It takes time to get people to accept that the aim of self supply piloting is different – to enable them to do what they choose. Once this aim is established the effects can be remarkable.

The effects are magnified within a process which empowers others to copy the changes. It is particularly remarkable if this is achieved without offering the rural users any direct financial benefit and asking them to cover the whole cost.

It will take time to fit this approach alongside conventional public sector and NGO initiatives, which cover all hardware costs. It is likely to work best if capacities can be built to serve both purposes, thus creating teams and management which cover household and public/NGO investments. The experience in Luapula shows this may well be possible but that it still needs time and strategic investment to develop fully.

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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.

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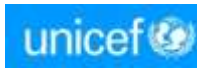
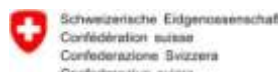
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