

Where every drop counts: tackling rural Africa's water crisis

In rural Africa, 'water poverty' can destroy lives and livelihoods. Children under five are highly vulnerable to waterborne diseases. While a broken waterpipe in London may be a temporary inconvenience, a failed well in sub-Saharan Africa is potentially catastrophic. And this is a catastrophe that is spreading across the continent, where an estimated 50,000 water supply points have effectively died. The root cause is the water community's failure to plan for maintenance of the infrastructure in a systematic way, creating a massive drag on meeting the Millennium Development Goal target on water and sanitation. Yet blueprints for building and financing wells of all types are available, and long-term provision of safe water is not rocket science. To be sustainable, direct investment in water supply infrastructure also needs to address the issue of who will maintain it, and where the money and skills to do so will come from.

Policy pointers

- **To meet the Millennium Development Goals (MDGs)** on water supply it is just as important to build the systems to keep existing boreholes working as it is to drill new ones, even if such work is more challenging.
- **Water management** demands more support through local government to ensure careful construction and attention to maintenance, village fund management and pump replacement.
- **Knowledge sharing among** the communities charged with managing their communal supplies – about the needed technology, upkeep costs, suppliers and other elements of water supply schemes – is key, and needs additional support.

Water holes: Africa's failed wells

Throughout rural Africa, tens of thousands of water points are drilled and dug every year – many of them boreholes, narrow well shafts equipped with motorised or hand pumps. In the context of Millennium Development Goal (MDG) 7 on environmental sustainability, this might seem a positive development: one of its key targets is to halve the proportion of people without sustainable access to safe water and basic sanitation by 2015. But much of Africa's water supply infrastructure is failing for a simple and avoidable reason: lack of maintenance.

In Burkina Faso, Ghana, Mali and a number of other countries across the continent, significant numbers

of boreholes, wells and handpumps in rural villages are falling into disrepair, often only a few years after construction. Recent surveys in the Menaca region of Mali found that 80 per cent of wells were dysfunctional. In surveys in northern Ghana, 58 per cent of waterpoints were shown as needing repair. These figures are not unusual. The water and sanitation foundation FairWater estimates that there are 50,000 dysfunctional water supply infrastructures across Africa.¹

That represents a failed investment of anything from US\$215-360 million, and impacts on livelihoods and health (see 'When a borehole fails'). If real and sustainable gains in total provision are to be made, in accordance with the MDGs, the underlying causes of this systemic failure to promote a

When a borehole fails

In rural Africa it is generally women who shoulder the burden of water collection. So if a village supply fails, women and children may have to go back to walking several hours to collect water each day. The alternative water from more distant rivers and marshes may carry dangerous pathogens, the lower volumes carried mean less family hygiene, the energy dissipated to carry water further than usual

saps strength and health, and the longer time spent walking diverts time from economically productive alternatives for women, and often from school participation for girls.

If the village has not succeeded in generating sufficient income for repairs, or that money has been squandered, their only choice is to await another passing donor. This may mean two or three years without clean water.

satisfactory and autonomous maintenance regime need to be addressed.

Priming the pump: the elements of success

Three components are key in an effective maintenance regime for water supply: the right technology, ownership by the communities involved, and local capacity to repair and maintain wells and systems.

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The technical aspects The design of boreholes, the choice of technology to extract the water, good contracting, and quality control for construction services are all

key for a sustainable water supply. A common cause of breakdown in waterpoints is a lack of quality control in the initial construction. Building good-quality infrastructure is critical to its longevity, as is the need to ensure that local people participate in the choice of technology most appropriate to their situation, rather than having it delivered 'on a plate'.

This raises issues of the technical proficiency of local contractors, the quality of works supervision, the management of potential local corruption in contracting processes, as well as clear technical specifications (for example, whether boreholes should be lined to allow easy rehabilitation, and to what depth).

The social dimensions Managing waterpoints involves village-level coordination, compromise, financial management and decision-making.

Increasingly, local people are being required to pay into a community fund for every 20 litres of water they use. A village committee is set up, a bank account opened, and a custodian appointed to collect fees. The committee is effectively charged with running a

small private water company whose aim is to ensure sustainable supply to the 400 to 750 people in any given village who use the borehole (see 'The social dimensions of water management').

It is therefore villagers who decide or refuse to claim ownership of a waterpoint. Clearly, a waterpoint delivered with no consultation will generate less enthusiasm to keep it maintained than one where people feel collectively committed to its upkeep. Even when due consultation has taken place, any suspicion of misuse or appropriation of the payments made by villagers for their daily water is likely to make them less confident and less willing to pay.

The way in which money is managed, decisions are taken and expenditure is justified within the village are critical sustainability considerations. So village water and sanitation committees must be able to account transparently to the village for the income collected and use of funds, and provide local leadership to fix problems as they arise. In some countries, public provision of water supply is seen as the role of government, and local people remain passive actors, expecting external agents to fund and maintain the system. Such lack of community mobilisation and commitment is a fundamental hurdle impeding sustainability.

Repair and maintenance capacity Trained mechanics and spare parts will be needed within a reasonable distance from the village. Prices need to be clearly stated and known by all, as this facilitates the costing and acceptance of payments for water. The local market within which maintenance skills operate needs to be vibrant, with a choice of suppliers and competitive pricing. Clearly, this will be simpler if villages in any one area all adopt a limited range of pumps and other water extraction technologies. The expansion of mobile phone networks in many areas has been a positive development, linking villages with mechanics who may live 60 kilometres away and previously took days to reach.

The social dimensions of water management

In a village in Gotheye commune, Niger, the chief runs the borehole. This has two footpumps, installed around 20 years ago. One broke three years ago. A man appointed by the chief collects fees for water at the working pump. But the village women, who draw the water daily, say he does not systematically charge the chief's friends and family the standard rates.

During a village meeting the people said funds to replace the broken pump were insufficient. The women are frustrated by the chief's management and fear the second pump will break, forcing them to rely on river water. They are willing to pay, but lack the social influence to lead on managing the pump. Equally, during the first few years of pump operation, water was not sold, so there is no capital fund for renewal and maintenance. As a result, the chief has been publicly accused of embezzling part of the fund, and there is no clear process for recourse.

Like many villages in Africa, this one needs outside help if it is to restructure the internal rules and pricing policy of its 'water supply cooperative'. That way, a trickle of revenue can, collected over time, pay for repairs and pump renewal – the maintenance issues that are crucial to community wellbeing and development.

The challenge of scale

Donors and governments would be justified in focusing mainly on the construction of new waterpoints if such an approach developed economies of scale in their maintenance. This is indeed the case in most urban water supply systems, where connecting an additional 1000 people to a network supplying 100,000 people will not lead to a *pro rata* increase in maintenance and management costs of 1 per cent.

In most of Africa, the decentralised nature of the rural water delivery infrastructure – where village wells may be 4 or 5 kilometres apart – means that each additional waterpoint adds an equal incremental burden to the already creaking maintenance system. This means

economies of scale are hard or impossible to find (see Graph, opposite).

So there can be no rationale for rushing to meet rural MDG targets through construction of new infrastructure without either paying attention to supporting sustainable maintenance of older systems, or ensuring that the new infrastructure is fully sustainable – that is, meeting all of the above criteria – from the outset. The burden of infrastructure falling into disrepair, in many cases within five to eight years, will inevitably catch up and outweigh new investment in future years.

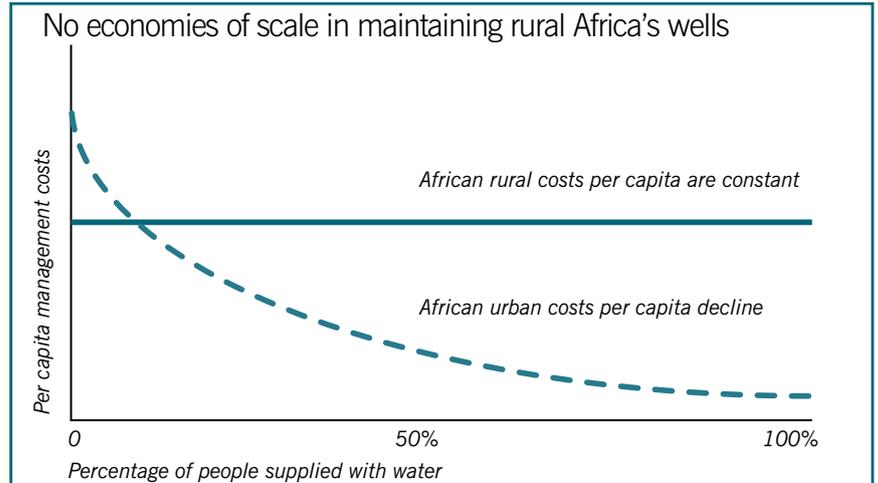
Ground force: boosting local capacity

Increasingly, for example in West Africa, national water policies are delegating water management issues to districts or communes and villages. This is logical, as that is the right level for administering these responsibilities. Yet it also has, at a stroke, multiplied by a factor of 10 the number of units that need to function correctly for the overall system to work. This dramatically increases the risk of system breakdown, which in turn leads to the kind of maintenance failures now seen so frequently on the continent.

Take Niger, one of the world's poorest nations. There are some 265 rural communes, or districts, in the country, containing 17,000 villages. Under current decentralisation policies, if these communes and villages are to lead national efforts to deliver the MDG target on water, it means building the capacity of each commune to effectively manage the engineering, construction and management dimensions of water delivery in the 60-odd villages within its jurisdiction. It also demands direct engagement with 17,000 village consultation processes to deliver the local capacity to manage each individual borehole or well. Yet neither the communes nor the villages have dedicated staff or financing to manage this task.

In response, governments, donors and NGOs have stepped in to compensate for lack of capacity. But these top-down interventions may also backfire, distorting markets and attitudes in ways that contribute to an overall systemic weakness, as pointed out in recent publications by WaterAid.² Taking the 'if you want something done, do it yourself' approach alone does allow the total number of water points to creep slowly upwards towards MDG targets. However, it does little to sustain the elements of a successful system, such as local ownership.

Government policy in most West African countries is to decentralise and delegate the provision of drinking water supply. This process of delegation is, however, not accompanied by the resources, or the methodological approach, needed to empower local processes and ensure sustainability.



Current management theory can offer insights here. It encourages a method of delegating where the 'do it yourself' approach is just one stage in a five-step process:

1. If you want something done, do it yourself.
2. Tell other parties what to do.
3. Coach them in how to do it.
4. Support them in doing it, on request.
5. Delegate full authority and resources and evaluate progress.

It is easier to build infrastructure than to invest in social processes, however. The water community in West Africa is still largely locked into step 1, and perhaps at times step 2, but is still a long way from adopting 3. Meanwhile, the current national policies often simply assume that capacity, finance and knowledge are available to accomplish step 5.

Point to point: building knowledge networks

A significant challenge in supplying rural Africa with water lies in sharing relevant skills and knowledge. How can the successful experiences, attitudes and knowledge needed to make a rural water system effective and sustainable be replicated, transferred and adopted by thousands of often nonliterate, widely dispersed waterpoint managers?

While part of the solution undoubtedly lies in the vibrancy and quality of available local skills and advice for water infrastructure management, it is communication between village and commune practitioners that could make a significant difference. They will know local conditions and issues intimately; and many of those issues will be similar across countries and regions. So any solutions they share will be more likely to work than some of the top-down, off-the-shelf approaches used by governments and nongovernmental

Water for African villages: 30 elements of success

What would a successful village water supply system in Africa look like? The four broad areas below outline the findings on what works in this context.

■ Technical

A competitive contracting market exists
Good technology has been selected, in consultation with local people, for the geotechnical characteristics of the site (such as shallow well vs pumped borehole).
Contractors are technically proficient and construct good-quality infrastructure.
Quality control/supervision of construction is effective.

■ Social

The village committee is representative and attentive to men's and women's views.
There is an agreed process for fixing access rights and prices.
People are willing to pay the agreed price.
Income is recorded correctly.
Funds are safeguarded against misuse and accumulate year on year.
There is a process for resolving conflicts.
Access for the poor or vulnerable is protected.

■ Repair and maintenance

Maintenance practices are clear across the village.
Everyone understands how to use the pump properly and reduce wear and tear.
Revenues are sufficient to pay for recurrent repairs
Investment in a new system.

There is a clear process for deciding on a repair/investment.
There is clear responsibility for who calls for a mechanic and when.
Skilled mechanics are available.
Repair costs are known and a market exists.
The mechanic can source spare parts in a timely fashion.
There is a rapid mechanism, such as mobile phone number, for contacting mechanics.
The committee accounts transparently to the village for use of funds.

■ Local government (commune/district)

The status of all waterpoints is known and in the public domain.
The coverage of water supply and sanitation in the area is known and in the public domain.
There is a process for prioritising budgets/interventions and coordinating NGO/donor contributions.
Capacity exists to contract and supervise works.
Decision makers are accountable to their constituents.
Processes are in place to share knowledge and experience on water and sanitation between villages in the commune.
Processes are in place to share knowledge and experience on water and sanitation with neighbouring communes.
Good technical advice is given to villages to help them solve waterpoint problems.
Villages are empowered to find solutions to their own water and sanitation issues.

organisations. Experience suggests that major efforts should be made to provide this kind of concerted advice and communication through rural radio station broadcasts, local 'water days' in communes or districts, and other means. Part of this communication process should promote community self-reliance in supplying their water, while identifying the local and central government structures, or private sector suppliers, who can help them manage their waterpoints effectively (see 'The 30 elements of water supply success in rural Africa', above).

Ultimately, communities and local government will need to engage the local market, and hold suppliers and mechanics to account for the price and quality of their construction and repair work that will provide the basis for a successful system. Donors and NGOs should focus on these actors in all water supply projects on the continent, and ensure that progress to full delegation of responsibility and funds is rapid. This approach carries its own inherent challenges, and will undoubtedly slow the rate of progress towards the MDGs, as it requires a

new borehole to be built along with social mobilisation, and behavioural change. But it is an essential move away from the simple delivery of newly engineered waterpoints towards a holistic and strategic solution that factors in sustainability, internalises maintenance and avoids waste. Embracing it means that donors and recipient countries can avoid an all-too-likely scenario in 2015. That is, the realisation that the massive investment in rural waterpoints in Africa since 2002 has provided clean water only until the first major breakdown – and has failed, at enormous cost in health and well-being to the communities it was meant to help, to provide lasting benefits.

It took the United Kingdom over 100 years to find a sustainable, structural solution to the maintenance investments demanded by its Victorian infrastructure for water and sewerage networks. Let's not wait that long for a solution in Africa.

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Further reading & websites

Cumming, O. 2008. *Tackling the Silent Killer: The case for sanitation*. WaterAid, London. See also www.wateraid.org/documents/tackling_the_silent_killer_the_case_for_sanitation.pdf. ■ UNDP. 2006. *Beyond Scarcity: Power, poverty and the global water crisis*. Human Development Report 2006. UNDP, New York. See also <http://hdr.undp.org/en/reports/global/hdr2006/>. ■ WHO/Unicef. 2006. *Meeting the MDG Drinking Water and Sanitation Target: The urban and rural challenge of the decade*. WHO, Geneva. See also www.who.int/water_sanitation_health/monitoring/jmpfinal.pdf. ■ Target 3, Millennium Development Goal 7: Ensure Environmental Sustainability: www.un.org/millenniumgoals/enviro.shtml. ■ UN-Water: www.unwater.org/discover.html. ■ Water Supply & Sanitation Collaborative Council: www.wsscc.org/. ■ WatSan.org: www.watsan.org/.

Notes

■ ¹ FairWater Foundation. 2009 Appeal. See www.watsan.org/show_detail.php?key=373&sgrp=548 ■ ² WaterAid. 2008. Think Local, Act Local. See www.wateraid.org/documents/plugin_documents/think_local_act_local_report_1.pdf.

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