Opportunities rising, cities sinking

Sean Furey talks about issues related to urban well drilling in low- and middle-income countries

A burgeoning manual drilling industry is spreading throughout West Africa. "In a month sometimes we do 15 boreholes, sometimes 10, sometimes six… I have many customers – industry, small business and households," says James Adejare, a manual driller in Lagos, Nigeria.

Around the world, cities in low- and middle-income countries are growing rapidly, and often their already weak water-supply infrastructure just cannot cope or keep up. Where there is a need, there is an opportunity, and one that drillers are keen to exploit. Many cities are in low-lying areas on shallow aquifers. So why wait for a pipeline to be built, when you can just dig down to find water?

Manual drilling is tough work, but start-up costs for equipment are low and a team can work in a confined space, an alley or backyard, where a mechanised rig could never get.

That's not to say that there isn't a market for conventional motorised drilling as well: in many cities, hotels, factories and offices can't operate if the city water utility can't provide certainty over quality and quantity of water, or if there is enforced rationing.

For households, getting a connection is either a pipe dream or not a priority, particularly in slum and peri-urban areas, where alternatives are either free (springs or shallow wells) or convenient (bottled or sachet water).

In 2013, I was in Monrovia, Liberia, shortly before the Ebola outbreak. I met with senior staff from the Liberia Water & Sewer Corporation (LWSC), and they admitted that they didn't have an inventory of all their pipe connections or customers – a situation not aided by the fact that the city has few street names and no house or plot numbers, so there isn't an address system around which LWSC can operate customer billing or asset management.

Many people I saw got their water from community hand pumps, installed by NGOs, from surface water ponds and ditches, or by buying small plastic sachets of water – a rapidly growing phenomenon in West Africa that is unregulated and penalises the poor through its high cost per litre.

Two years later I visited Jakarta, Indonesia – a megacity of more than 10 million people. The city's water comes from surface water sources inland, but this can only meet 30% of the city's demand and the water utility cannot fill its pipes.

People need water. Is it any surprise that the people will take the initiative and invest in their own solutions? But if enterprise is filling this gap, meeting demand and creating jobs, what is the problem? At first glance, a private water supply, such as a borehole in the backyard, is a very sensible, rational response: water users are taking back control over an essential daily resource.

Using low-cost technologies, such as manually drilled wells and simple pumps should also be pro-poor. In many rural areas this is certainly the case, and something that we encourage through the Rural Water Supply Network. In cities and towns, however, it's more complicated.

Photo: K. Danert, 2014

A manual drilling team in a private backyard in Lagos, Nigeria
Inset: Sean Furey

It is generally richer households, and business, that can afford to drill deeper wells with better well-head protection. They do this not just to adapt to the poor service provided by a city water authority, but also to avoid paying their water charges.

This deprives the utility of much needed revenue that could help improve the service and cross-subsidise across the network, so that poorer areas can be served. Breaking this cycle is tough.

A common response is for an international donor to pump money in the hope that if the infrastructure is built, the service will improve, and customers will be attracted to the service and the private and public sectors will invest. However, changing pipes is one thing, changing minds is another.

In Bangladesh, for example, a World Bank study on public-private partnerships concluded: "The existence of alternative sources of water, such as shallow wells, has deterred private operators from providing services. In most areas, households have private shallow wells, while industrial or commercial establishments have deep wells. Neither type of customer provides the demand needed to justify piped supplies."

Again, is this a problem? For poorer residents, yes it is, because their shallow wells will be the first to dry up, the first to be contaminated by nearby pit latrines and uncontrolled industrial discharges, and in coastal areas, they are often the first to become brackish and then unusably saline.

This forces them to travel further each day to collect water, or to buy over-priced and unsafe water from water vendors who bring water in by trucks.

They could drill deeper, but with declining water levels from so many private abstractions in a small area, it is a race to the bottom. This is a rural issue, too: in Marathwada, India, the

authorities turn a blind eye to regulating groundwater abstraction and the drilling of new boreholes. As groundwater levels decline, farmers get more desperate and pay more and more to drill deeper and deeper. In the absence of regulation or enforcement, why would a driller turn down work?

The rich don't always escape either: in Jakarta, much of the city is sinking at the rate of 3-10cm per year. Buildings and infrastructure are cracking, and more and more of the city is dropping below sea level. Immense pumps are needed to propel the monsoon rains up from a lagoon into the ocean. Groundwater pumping from private boreholes is the number one cause of this subsidence.

So what to do? These are complex problems, and every context is different. A research project, called T-GroUP, is working in Arusha (Tanzania), Dodwa (Ghana) and Kampala (Uganda) to understand how groundwater is used in slum areas, using an innovative method called 'transition management' to manage the social, technical, political and economic feedback loops to achieve better groundwater management that benefits everyone. In the meantime, it is clear that if the common good cannot be achieved through unfettered market forces, then government needs to step in and regulate effectively and fairly – and to do this needs openness and transparency to eliminate the space for corrupt practices.

Furthermore, city water utilities need to be able to provide a high-quality, affordable, accessible service. In rapidly growing cities this may mean having a more modular approach to water supply that also brings in groundwater recharge and rainwater harvesting. Good customer service is essential and smart, easy payment systems are increasing revenue collection – for example, in Kampala, you can pay your water bill easily by phone app, SMS or phone call. In general, people pay for convenience, so the route to success is to make water supply as easy as turning on a tap. But what of the drillers like James Adejare? He is proud of the business that he has built and hopes one day to hand it down: "I have a son; I will teach him how to drill, because I want continuity," he says. "I am proud about it." He may only be able to if he, and many drillers like him, accept that more regulation is in everyone's interest. ♦

Further reading

- Urban Groundwater Dependency in Tropical Africa (2017): https://upgro.files.wordpress.com/2015/09/urban-groundwater-report_0015.pdf
- Resilient Cities and Groundwater (IAH): https://iah.org/wp-content/uploads/2015/12/IAH-Resilient-Cities-Groundwater-Dec-2015.pdf
- UPGro: T-GroUP: Experimenting with practical transition groundwater management strategies for the urban poor in sub-Saharan Africa: http://t-group.science

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