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**DELIVERING WATER, SANITATION AND HYGIENE SERVICES  
IN AN UNCERTAIN ENVIRONMENT**

**Multiple benefits of improved groundwater for low-income  
urban communities in Kisumu, Kenya**

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*Most studies of access to water by the poor focus on their 'primary' source of drinking water. Even on this count, in sub-Saharan Africa, 30% of urban households rely directly on water from wells. However, this only tells part of the story. The work of Practical Action and our project partners in Kisumu has revealed how poor urban households rely on a diverse range of water sources of differing quality and price for different uses (drinking, cooking and washing). We find that 45% of households in 4 informal settlements in Kisumu are using borehole or surface water for at least some of their needs. Access to these sources is an important part of their coping strategies when there is a shortage of piped water or when household circumstances change. However, the quality and accessibility of the water can be poor. Improving access not only to piped water, but also to good quality water from protected springs, shallow wells and community-managed boreholes, can have great benefits in particular for women. This paper illustrates the diverse benefits that can accrue, and highlights some of the policy issues that arise.*

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## **Introduction**

Globally, an estimated 269 million urban dwellers depend on wells as their principle source of drinking water. In sub-Saharan Africa and Asia, this means an average of 30% of households depending directly on nearby wells (Grönwall, Mulenga and McGranahan, 2010: 14). This dependence appears to be growing. This usage is generally dismissed as irrelevant, as it is assumed that groundwater sources do not provide adequate water, that their use is marginal to people's needs, and that it should be eliminated as piped water sources expand. On the contrary, despite usually falling 'below the radar', the reality for poor people in urban contexts across Africa, is that access to groundwater can be a very important coping mechanism, especially in contexts where even the reliability of supply and price of piped water is highly variable due to a combination of technical or seasonal factors. However, use of untreated groundwater can leave people highly vulnerable to disease outbreaks.

In Kenya, the International NGO Practical Action has been working in the city of Kisumu over a number of years. Since 2008, we have worked in partnership with two Kenyan NGOs, KUAP and Shelter Forum, and with funding from Comic Relief, in a project called 'People's Plans into Practice'. It aims to build the capacity of local communities in four large low-income settlements (Kondele, Manyatta B, and Nyalenda A and B) to develop participatory plans, and implement actions in partnership with a range of other stakeholders to address some of their priority issues. Many of these priorities have focused around services including access to water, and Practical Action has supported local communities in improving their access to safe sources of water both through improved access to the piped network, and through a new borehole and the protection of natural springs.

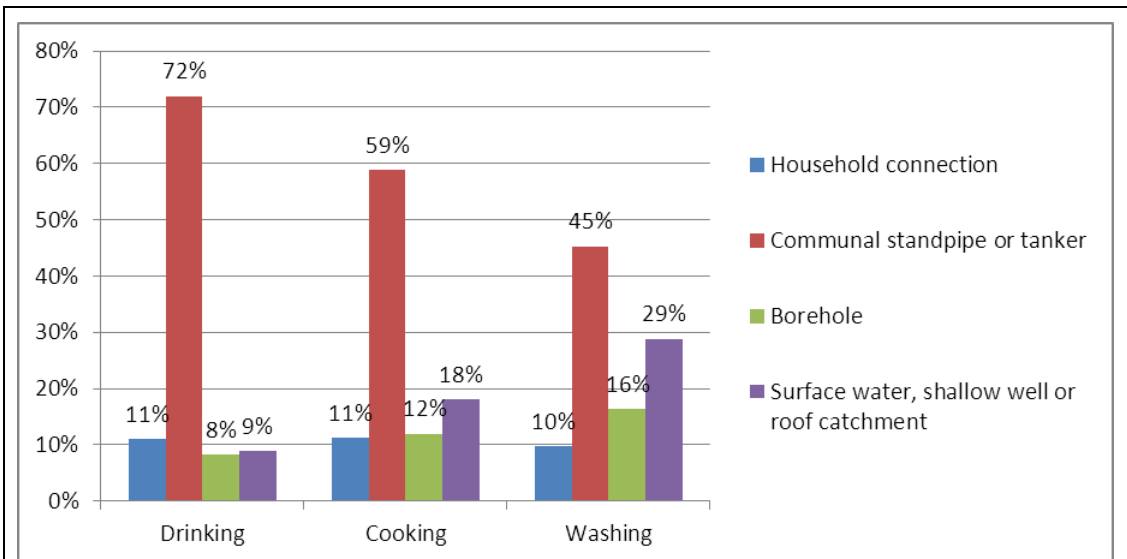
This article highlights the importance of access to these sources of water and the multiple benefits that can accrue, in particular to women, of improving the flow and safety of these resources.

**Access to water in low-income settlements in Kisumu**

Kisumu is Kenya’s third largest city, lying on the banks of Lake Victoria. At the time of the 2009 census it had a population of 508,000. The city has not benefitted from the fruits of economic development felt elsewhere in the country, and in early January 2008 its low-income neighbourhoods were particularly badly affected by post-election violence. The City Development Strategy of 2005 (UN-Habitat 2005a) found that 48% of the population fell below the (income) poverty line, and 53% below the food poverty line.

In terms of access to water, the 2005 situation analysis of the town’s informal settlements (UN-Habitat 2005b) reported that the city water utility provided piped water to only 40% of the population. For the rest, “as a coping mechanism, a majority of slum dwellers rely on unprotected wells and springs that are subject to high degrees of contamination due to the rampant use of pit latrines and to high water tables”.

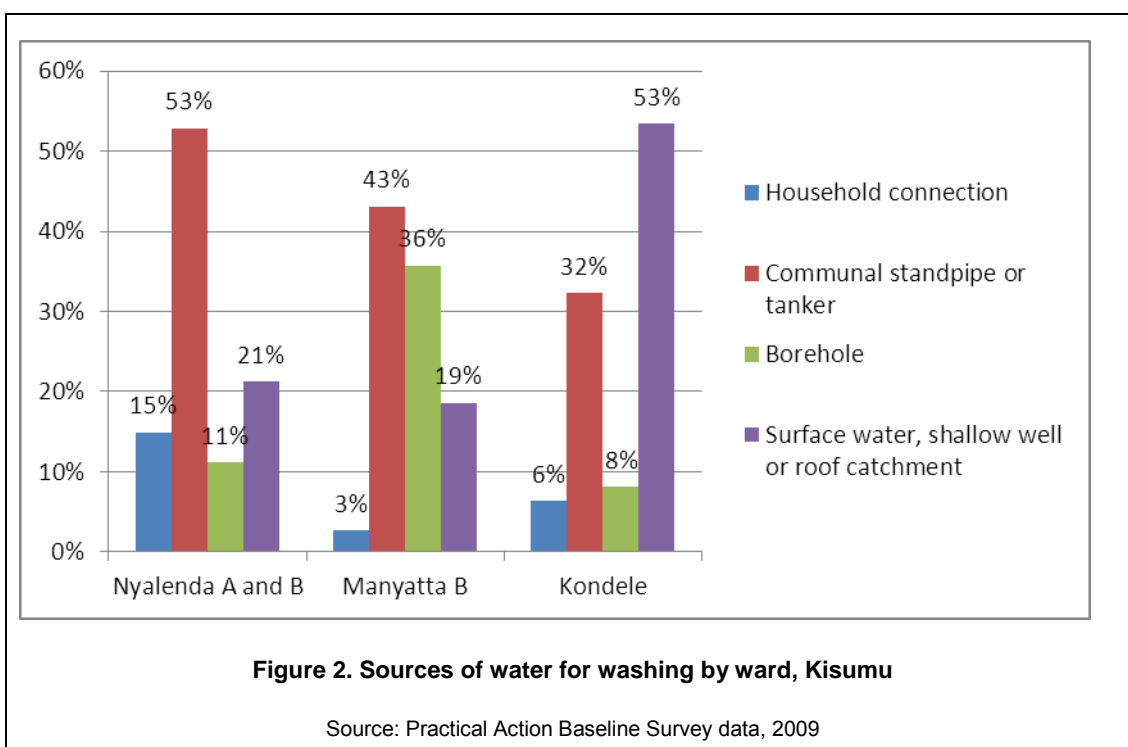
As part of our baseline survey in 2009, covering 1573 residents across four informal settlements, we asked people about the sources of water they used for drinking, cooking and washing. Although this does not capture seasonal changes, it does give a better picture than in many surveys about the variety of water sources in use, and in particular the extent to which people vary their choice of water source according to use. As Figure 1 shows, while 83% of people use piped water (from a household connection, communal standpipe or tanker) for drinking, only 55% use these sources for washing. The proportion of people relying on water from shallow wells, streams, ponds or rainwater from the roofs rises from only 9% for drinking water, to 18% for cooking and 29% for washing.



**Figure 1. Sources of water for different uses, 4 informal settlements, Kisumu**

Source: Practical Action Baseline Survey data, 2009

The situation of water access varies across the four informal settlements in which we were working, with far less access to piped water even for drinking in Kondele (56%) compared to Nyalenda (85%). People in Manyatta B have access to a borehole, but appear not to trust the quality for drinking. In Kondele, there is not even this choice. People struggle as best they can to get good quality water for drinking, but 53% rely on surface water when it comes to washing. Similarly in Manyatta B, 45% rely on borehole or surface water for cooking and 54% rely on these sources for water for washing.



Added to this, we found that the supply of piped water is unreliable with frequent water shortages. During these periods, the price of piped water often increases dramatically, and households will fall back even more on surface and borehole water. Overall, 62% of residents said they experienced water shortages either frequently (daily) or sometimes (weekly). Only 21% said water shortages happened ‘rarely’. The situation was worst in Manyatta B where 70% of people said they experienced daily or weekly water shortages.

As part of the PPP project, neighbourhood planning associations were formed, which came together to discuss and prioritise their community’s development needs. These were brought together as ‘Strategic Ward Action Plans’ (SWAPs) which inform the municipal authorities about development needs. The communities used them as part of lobbying for the allocation of decentralised resources to their priority issues. Water and related interventions feature among the top five needs in all the settlements.

In Manyatta B, for example, the ward was divided by the community representatives into three distinct ‘units’ for planning purposes. 83% of people in the ward rely on piped water for drinking, but access is difficult, with only 3% having household connections. This was the ward that reported the most frequent water shortages. For washing water, 36% rely on borehole water, and 19% on surface water. Each of the three units identified a lack of adequate clean water as part of their discussions about the development challenges they face. The specific issues raised were:

- *Upper Unit:* Water is contaminated. Piped water has to be fetched from Kondele ward, and can cost up to KSh10 for 10 litres.
- *Central Unit:* Few water points for piped water. The supply of water relies on electricity for the borehole which is unreliable, and hence water supply is unreliable.
- *Lower Unit:* Supply by KIWASCO is inadequate and irregular. Poor quality water pipes burst and spill water. Many instances of water-borne diseases.

### Project interventions on water

As part of the five-year ‘People’s Plans into Practice’ project (2008-2013) Practical Action, in collaboration with KUAP, has delivered the following interventions to improve access to water in Kisumu:

Settlement / Ward	Nyalenda A & B	Manyatta B	Kondele	Total
Protected springs	8	-	-	8
Shallow wells	-	-	5	5
Borehole and kiosks linked to it	-	1 borehole 2 kiosks	-	1 (2)
Water meter chambers, and associated kiosks from piped network	0 chambers 3 kiosks	22 chambers 3 kiosks	19 chambers 5 kiosks	41 chambers 11 kiosks

There has been a balance of interventions depending on the opportunities and needs in each of the wards, with some interventions for safe access to surface and ground water (springs, wells and a new borehole), and some to help extend the piped network into informal settlements through meter chambers where either individuals can connect, or to which water kiosks can be connected. In terms of piped water, this has been accompanied by negotiations to reduce the price of bulk supply of water from KES 37 to KES 25 per cubic meter.

The overall effect of these interventions has been to increase the quantity and quality of water, lower the price and reduce the distance travelled to access clean water. On average, the protected springs have a flow rate of 0.6 litres per second which means a 20 litre jerry can be filled in just over 30 seconds. By channelling and protecting the springs, greater volumes of water are made available to residents. The springs alone serve more than 3,000 households (15,000 people). The average walking distance to the nearest water point has been reduced from 200m to 100m.

In terms of costs, the interventions relating to piped water and borehole water have helped significantly reduce the price of drinking water. This is partly because of the successful negotiations to reduce the price of bulk water supply. It is also related to investments made in increasing bulk water supply quantity and regularity which the water company were supported for through the French Development Agency. This means that shortages (and the associated price spikes) are far less frequent. In terms of the cost of water from springs and wells, there have been some attempts to introduce small charges by the owners of the land, but many people do not pay because they have traditionally used the resource for free. There are associated costs of maintenance, and the project is working on better agreements between the land owners and community committees about how these costs will be met in future. Overall, however, the costs will still be far lower than those charged for piped or borehole water.

### **Multiple benefits, particularly for women, of access to water**

Women and girls are primarily responsible for providing water for all their household's needs. Improved access to these resources reduces drudgery for women and children who often help with the task. Analysis of citizen report cards for 2010 found that households in Kisumu relying on water from kiosks spent almost 2 hours (112 minutes) per day collecting water, which could rise to more than 3 hours (200 minutes) in times of scarcity (Uwazi, 2010). This equates to the kinds of figures found for women in rural areas of eastern Uganda who spend 660 hours per year collecting water, which equates to two months of labour (UNDP 2006). Women save time accessing water whether from the new extensions to the piped network, or from ground and surface water sources.

For example, Melsa Akoth Otieno, collects water every second day from 'Tunya water kiosk' constructed by the project. She undertakes 10 trips ferrying a 20litre jerry can for a 10 min walking distance. Previously, she used to walk 2km to a dam. Merlyn Oduor, heavily pregnant also collects a similar quantity of water for her family of four. Venessa Achieng finds that assured access to water from a kiosk near to her home has freed up her time to manage her little shop which she otherwise had to close or leave with a friend or relative when she went to fetch water.

The surface water has had particular benefits because of the greater flows of cheap or free water which have allowed for diversified economic activities through aquaculture and vegetable farming. One 55 year-old widow, the breadwinner for 11 children, was struggling to keep her older children in secondary school, and relied entirely on help from well-wishers for their school fees. The income from her small grocery shop

selling vegetables was not enough. With access to nearby water from a protected spring she has been able to branch out into cultivating her own vegetables on a small plot of land, increasing her sales from around KSh 1,500 per week to over KSh 4,000. She can now comfortably feed her children and pay their school fees. About ten households have taken up this business opportunity, and others are cultivating small quantities for their own use. They all report better nutrition for their children, better health, and small savings of money on food and healthcare costs.

There have also been wider benefits in terms of health. KUAP have reported that access to clean water has resulted in reduced water related diseases in the area, based on the data collected at the health centers managed by their organization. Physical security for women has improved too, especially at the springs and wells. Previously these were isolated and secluded. The improvements have made them more visible and women feel safer using them.

We have found that of all the water-related interventions we have introduced, the protected springs have been used in the most diverse ways with a whole range of unexpected spin-off benefits. This is due to access to a constant flow of water that is cheaply or freely available. The water is now potable, and people are able to reduce their reliance on piped water (which they use preferentially for drinking). The availability of potable water from these sources is invaluable as a fall-back. It is also producing a wide range of knock-on benefits in terms of health, incomes and security.

### **Conclusions and policy implications**

The right to water is recognised in the new Kenyan Constitution, and in most cases in urban areas it is envisaged that this will be supplied through the piped network. However, as the situation in Kisumu illustrates, the task is enormous and progress is only likely to be made very slow. Beyond that, we realise that even if piped water were to reach everyone, and even if it were reliable and consistent in price, people would continue to use self-supply of water (from boreholes, springs and rainwater from roofs) for at least part of their water needs. It serves as an important coping mechanism for vulnerable populations and brings multiple benefits in particular for women.

Legally, all water in Kenya is owned, and regulated, by the government through local water boards and Water Resource Regulatory Authorities. The right to channel and sell this water is held by water utility companies and local communities. Any work to develop and use water resources is regulated and co-ordinated by the Water Board. However, this has not represented a threat or a specific blockage when it comes to urban surface and groundwater sources. In fact, as has been found elsewhere around the world, these sources and their use fall largely under the radar of the authorities.

The lessons of this work for agencies working in other communities, is the importance of understanding the sources of water that people already use for different purposes, and of protecting and improving people's access to a range of sources. At the same time, it is vital that these resources remain in the hands of the users. This can make a big difference to building people's resilience in the face of uncertainty (unreliable supplies of piped water, seasonal floods, disease outbreaks, changes in water governance etc). In practical terms, there is much that can be done in terms of spring protection, and the seasonal use of chlorine. Beyond that, more attention will continue to be needed in issues of point-of-use water treatment and safe storage (applying to piped water as much as to water from springs and boreholes). Communities more generally and water point committees specifically may need to be supported to ensure the sustainable management of their resources to the benefit, in particular, of their most vulnerable members.



**Photo 1. The drudgery of ferrying water from a spring before rehabilitation**



**Photo 2. Protected Spring, Kisumu**

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