

Impact case study (REF3b)

Institution:	Loughborough University
Unit of Assessment:	B14 Civil and Construction Engineering
Title of case study:	Improved access to urban water services for over a million people in Uganda and other developing countries
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>Over a million urban dwellers in several developing countries are accessing water services as a result of research undertaken at Loughborough University. National Water and Sewerage Corporation (NWSC), Uganda’s main urban water utility, applied the research findings to improve service quality, and extend piped water supply to the previously un-served. During 2008-2011, over 500,000 additional urban residents accessed piped water supply of improved bacteriological and physico-chemical quality – resulting in significant enhancement of <i>health</i> and <i>quality of life</i> (particularly of children). Furthermore, the research benefits were transferred to other countries, through the work of NWSC’s External Services Department, extending the reach to other countries including Kenya, Tanzania, India and Zambia.</p>	
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>According to the WHO/UNICEF Joint Monitoring Report 2012, only 16% of people in Sub-Saharan Africa currently use piped water. Increase in water service coverage in sub-Saharan Africa and southern Asia were predominantly through basic, non-piped services – such as boreholes, springs and hand-dug wells, which are highly susceptible to contamination in urban areas. To increase the number of people with access to clean, safe piped water, research was undertaken in Uganda, Kenya and India (2000–2004) by researchers based at Loughborough University’s Water Engineering and Development Centre (WEDC) – Sam Kayaga (Senior Lecturer, 2002-to date), Kevin Sansom (Lecturer, 1996-to date), Sue Coates (1999 to 2012), Sam Godfrey (2001 to 2006), Guy Howard (2000 to 2005), Kala Vairavamorthy (2002 to 2005) and Cyrus Njiru (1999- 2005). All the three main projects were funded by the UK’s Department for International Development (DFID) and implemented by Loughborough University researchers.</p> <p>In the first of three main projects, <i>Serving all urban consumers</i> ([G1], 1998–2003), the researchers studied how – without compromising their financial position – water utilities can use pricing and service differentiation to sustainably extend piped water services to a broader range of users including, in particular, poor households. They found that contrary to an assumption often made by utility managers, poor city dwellers were likely to be able and willing to pay for piped water at normal per unit prices, provided up-front installation charges were reduced or removed [R1]. The researchers produced and disseminated resulting sets of guidelines on how water utilities, working with other key stakeholders, can meet the needs and demands of urban water consumers, particularly poor households [R1, R2, R3].</p> <p>In the second project, <i>Improved Risk Assessment and Management of Piped Urban Water Supplies</i> ([G2], 2002–2004), the researchers developed and validated a methodology for implementing Water Safety Plans (WSPs). These are quality-assurance processes for effective risk management in water distribution systems in developing countries. Using piped distribution networks in Kampala and Jinja (Uganda) and Guntur (India) as case studies, the researchers disseminated to water utilities in developing countries four sets of guidelines for developing and implementing WSPs [R4, R5].</p> <p>In the third project, <i>Charging to enter the water shop?</i> ([G3], 2003–2004, in collaboration with Cranfield University), the WEDC researchers conducted a case study in the Ugandan cities of Jinja and Kampala. Their aim was to determine the cost of urban piped water connections for the poor and how charges are normally made for it. The research demonstrated the true magnitude of the barriers to connection experienced by the urban poor. The researchers discovered that the mean cost for a new water connection was about US\$500, which was unaffordable for low-income households, with an average income of \$2 per day [R6].</p> <p>Based on these research findings, which were published in leading journals, new service delivery models were developed, as part of NWSC’s change management programme, and embedded into</p>	

the utility's policies and practices, which has resulted into improved service quality and extension of water services to those previously un-served.

3. References to the research (indicative maximum of six references)

Improved access to urban water services related research has been reported in 31 peer-reviewed journals since 1993, including the journal papers cited below to evidence the quality of the underlying research:

- R1 Njiru C and Sansom K (2003) “Strategic marketing approach to urban water services in developing countries”, *ICE Proceedings – Municipal Engineer Journal*, 156(2), 143-148. –Published in a peer-reviewed journal, DOI: 10.1680/muen.2003.156.2.143.**
- R2 Sansom, K. , Franceys, R., Njiru, C., Kayaga, S., Coates, S. and Chary, S. (2004) *Serving all urban consumers - a marketing approach to water services in low- and middle-income countries: Book 2 - Guidance notes for managers*, WEDC, Loughborough University (published after an external review process involving DFID Advisor and other international reviewers). ISBN 1 84380 055 1.
- R3 Coates S., Sansom K.R. and Colin J. (2005) “Water Utility Consultation with the Urban Poor in Developing Countries”, *Proceedings of the Institution of Civil Engineers, Municipal Engineer Journal*, 158(3), 223-230 - Published in a peer-reviewed journal, DOI: 10.1680/muen.2005.158.3.223.
- R4 Howard, G., Godfrey, S. Tibatemwa, S. & Niwagaba, C. (2005) “Water safety plans for piped urban supplies in developing countries: a case study from Kampala, Uganda”, *Urban Water Journal*, 2(3), 161-170 - Published in a peer-reviewed journal, DOI: 10.1080/15730620500236567.**
- R5 Godfrey, S. and Howard, Guy (2005) *Water safety plans - Book 1: Planning water safety management for urban piped water supplies in developing countries*, WEDC, Loughborough University (published after an external review process involving DFID Advisor and other international reviewers). ISBN 1 84380 052 1.
- R6 Kayaga, S. and Franceys, R. (2007) “Costs of Urban Utility Water Connections: Excessive Burden to the Poor”, *Utilities Policy*, 15(4), 270–277 - Published in a peer-reviewed journal, DOI: 10.1016/j.jup.2007.06.002.**

Grants

- G1 Sansom, *Serving all urban consumers – a marketing approach to water services in low- and middle-income countries*, DFID Knowledge and Research (KaR) Project No. R7130, 1998-2002, £213,215.
- G2 Howard, *Improved Risk Assessment and Management for Piped Urban Water Supplies*, DFID Knowledge and Research (KaR) Project No. R8029, 2002-2004, £403,434.
- G3 Kayaga, *Charging to enter the water shop?’ – determining the charges and costs of urban connections for the poor*, DFID Knowledge and Research (KaR) Project No. R8319, 2003-2004, £18,000.

4. Details of the impact (indicative maximum 750 words)

In summary, the research carried out by WEDC resulted in the design and implementation of significant aspects of NWSC’s change-management programmes (2000-2011). This produced improved access to water services for existing customers and increased numbers of new customers (an additional 526,000 people, including 196,000 residents in the urban informal settlements, in all of NWSC’s service areas), all of which received a better service in terms of quantity and quality of water received. Most impact of this research has occurred since 2008.

Implementation of the project *Serving all urban consumers*, led by Loughborough University (Sansom, Kayaga, Coates and Njiri) produced guidelines for getting to know and understand all consumer groups [R3]; targeting and providing differentiated services to low-income consumers; and developing and implementing a strategic marketing approach to service delivery [R1]. Specifically, this research influenced NWSC management to set up the Urban Pro-Poor Unit in

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Kampala [C1]. This in turn led to improved utility services to the urban poor. For instance, in low-income poor settlements, the number of people served increased from 923,600 in 2008, to about 1,120,000 in 2010 [C1, C2, C3]. Improved access to water in turn led to improved quality of life and enhanced economic opportunities [C4].

Improved Risk Assessment and Management of Piped Urban Water Supplies was a joint action-research project carried out by WEDC, NWSC and Makerere University (Uganda). Through this action research, the procedures for water-quality management in NWSC were revised in 2007 to incorporate water safety plans (WSPs). Since 2007, implementation has been rolled out to other service areas [C4]. The result has been delivery of better-quality water services to urban consumers in Uganda (Figure 1 below), leading directly to enhanced health of the population.

The researchers shared the findings they made in the *Charging to enter the water shop?* project with senior NWSC managers in April 2004. The findings on the connection expenses to poor urban dwellers and on other related barriers to uptake convinced NWSC to revise its policy and procedures for effecting new connections [C5]. In particular, they simplified the process and offered new financial incentives to applicants. As a result, the number of connections increased significantly from 202,559 in 1998 to 272,406 in 2011 (Figure 2), a 34% increase. Furthermore, the estimated population benefiting from these new connections increased by 28% to 2,426,000, with an additional 526,000 individuals benefiting in this area alone.

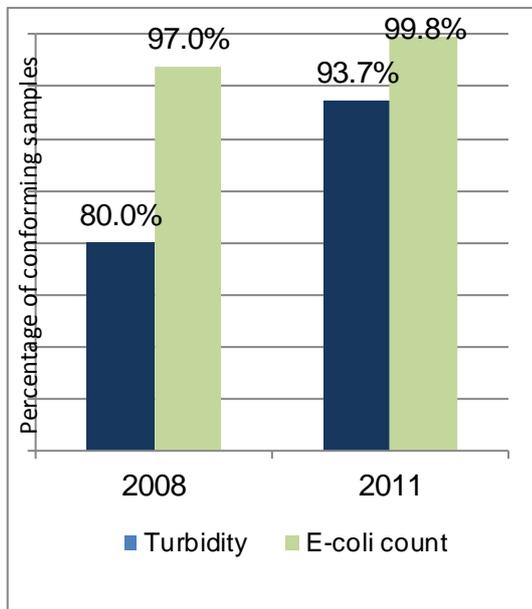


Figure 1: Number of water quality samples conforming to WHO standards [Sources C2, C6, C7]

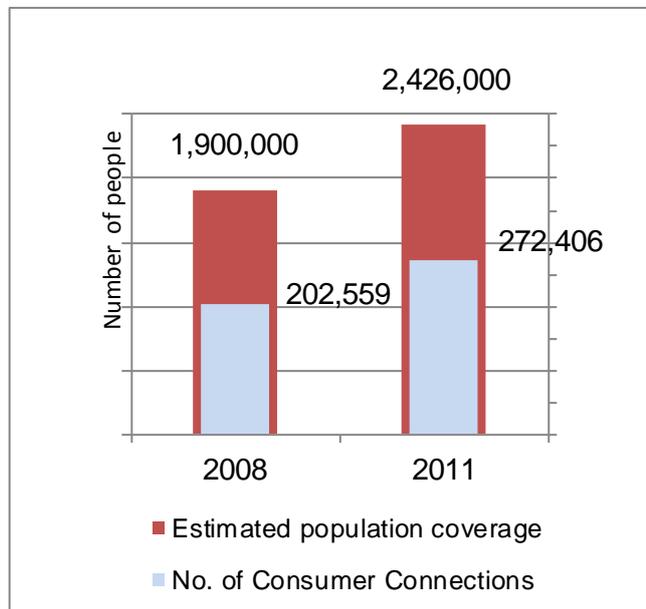


Figure 2: Improvements in access to urban water services [Sources C2, C7]

NWSC’s change-management programmes – based on WEDC research – had four significant types of positive impacts with huge outreach:

- i. Existing customers received better quality water services and customer care, which increased their willingness to pay for water services [C2, C3, C5]
- ii. The number of new customers increased, mainly due to simplified connection procedures, financial incentives, better customer service and positive word of mouth from existing customers [C2, C3, C5, C7]
- iii. Through a combination of i and ii, the revenue base of NWSC increased significantly, which greatly contributed to their improved institutional capacity, launching NWSC into a virtuous circle of organisational performance. For example, NWSC’s turnover increased by 31% from Uganda Shs. 100.6 billion (£24.4m) in 2008 to 131.5 billion (£31.9m) in 2011 [C2, C7]
- iv. NWSC implementation of the urban pro-poor policy and programmes led to significant improvements in water services delivery to informal urban settlements [C1, C3, C4]

The improvements in water services had more far-reaching impacts on residents living in poor

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urban settlements [C1, C2, C3, C4]. Box 1 shows results of a post-project impact study undertaken by independent consultants on the operationalization of the Urban Pro-poor Unit (UPPU) in one case study area of Kagugube Parish, Kampala.

Box 1: Findings of post project impact study (Winsor Consultants [C4])

Estimated population of Kagugube Parish - 15,000;

Number of respondents: random sample of 312 - 65% female; 35% male

	2004 Baseline survey	2011 Impact study
Use piped water	69%	90%
Use other unsafe point sources	31%	10%
Use at least 80 litres per house/day	72%	83%
Reported incidences of malaria	39%	31%
Reported incidences of bilharzia	5%	0%

Perceptions of respondents about the improved service delivery by UPPU

34% thought it has contributed to their increased use of safe water

54% thought it freed time for women

42% and 34% thought child abuse reduced student attendance increased, respectively.

NWSC set up an External Services Unit with the goal of sharing knowledge and expertise with other water utilities in the developing regions. Since then, NWSC has provided advisory and consultancy services in change management programmes for urban water utilities in 12 countries in Africa, Asia and the Caribbean. These activities have extended the reach and significance of impacts of our underpinning research to these utilities and the consumers they serve in the respective countries [C8, C9]. The research-induced best practices have now been embedded in the policies and practices of these utilities.

5. Sources to corroborate the impact (indicative maximum of 10 references)

The following sources of corroboration can be made available at request:

- C1** NWSC Power-point Presentation on the impact of the Urban Pro-poor Unit, to a project evaluation team from the African Development Bank. The unit emerged from the strategic marketing approach to water services in the *Serving all urban consumers* research project
- C2** NWSC Annual Reports (2008-2011) showing the trends of improved performance at NWSC
- C3** Written testimony from NWSC's Senior Manager, Operations, supporting the case puts forward for the impact, which relates to all three main research projects.
- C4** A post-construction impact study report on the Urban Pro-Poor Unit, carried out by independent consultants. This development of this unit emerged from the strategic marketing approach to water services in the *Serving all urban consumers* research project
- C5** NWSC's Customer Service Charter, explaining the new policy on new connections, which emerged from the *Charging to enter the water shop?* This research output advocated a lowering of connection
- C6** A brief from Quality Management Department of NWSC, describing the development and implementation of water safety plans this relates to the introduction of Water Safety Plans that was advocated in the *Improved Risk Assessment and Management of Piped Urban Water Supplies* research project
- C7** Uganda Water Sector Performance Reports for 2008 to 2011 which show the NWSC urban water improvement trends within the overall water sector
- C8** The service booklet for NWSC External Services Department, describing their vision, mission and activities
- C9** Written testimony from NWSC's Principal Engineer, External Services Department, supporting the case for the impact, which relates to all three main research projects.