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**Closing the knowing-applying gap in water utilities:  
experience from Uganda's NWSC**

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*In recent decades, there has been a steady rise of knowledge and capacity development (KCD) interventions targeting water utilities in developing countries. However, field experiences show that very often little change occurs in what water utilities' professionals and managers do as a result of capacity development efforts. Notwithstanding that, there are also some cases of success. In this paper, the authors argue that very often the main challenge facing utilities is not the development of utility competences per se, but their actual use. Drawing on the case of Uganda's National Water and Sewerage Corporation, we identify and discuss five interrelated factors that have allowed the corporation to progressively turn its knowledge base into improved performance, by means of its change management programmes. The paper concludes that water utilities can bridge the knowing-applying gap by carefully introducing a corporate culture, and management systems and structures that motivate staff to apply their knowledge.*

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**Introduction**

At the end of the International Drinking Water Supply and Sanitation Decade (1981-1990), it became clear that the provision of hardware infrastructure alone was no panacea for water supply problems in developing countries. Strengthening the capacity of individuals, institutions (including organizations) and the creation of an enabling environment was recognized as being equally important (Alaerts et al., 1991; Schwartz, 2008). Therefore, Knowledge and Capacity Development (KCD) interventions in water utilities multiplied using different mechanisms, notably public-private partnerships, reforms of public utilities by introducing business-like management practices (Schwartz, 2008), and water operator partnerships (Brown, 2002; Schwartz, 2008, Coppel and Schwartz, 2011), in addition to traditional education and training. However, successful utilities in developing countries are still rare, as many are still locked in a spiral of capacity and performance problems (Baietti et al., 2006; Mugisha and Brown, 2010), resulting in an inability to extend their services to consumers, especially the poor. In this paper, the authors argue that many utilities in developing countries are unable to perform well, not necessarily because they lack the necessary capacity, but rather because they lack the ability to turn the knowledge at their disposal into action. Utility managers may know what specific changes and decisions are needed to improve performance; likewise, water professionals may possess technical, managerial and governance competences to perform tasks, and work standard procedures may be in place. However, as long as these competences are not used and applied, a utility will continue to have poor performance no matter how much new knowledge is acquired. This paper investigates how a successful water utility in a developing country has been able to foster the application of its knowledge base, resulting in improved performance.

Theoretically, the paper draws on theories of knowledge management and learning: the knowledge value chain (Weggeman, 1997) which emphasizes four processes of knowledge management (acquisition, sharing, application and evaluation), knowledge conversion modes (Nonaka and Takeuchi, 1995) including socialization (from tacit knowledge to tacit knowledge), externalization (from tacit knowledge to explicit knowledge), combination (from explicit knowledge to explicit knowledge), and internalization (from explicit knowledge to tacit knowledge). These activities must take place before new knowledge can be used

and affect organisational performance. This literature posits that knowledge application is a crucial step in the learning cycle and that organisations must have an appropriate learning infrastructure (physical, psychological, social, managerial, political, etc.) in place as well as dedicated leaders and /or change agents to make this happen. The paper is structured as follows. Section two presents the methodology used in this study. Section three introduces the change management programmes implemented in Uganda's National Water and Sewerage Corporation (NWSC) and discusses the main factors underlying the actual application of knowledge. Section four concludes the paper.

## Methodology

Given the focus of this paper on how a water utility can ensure the application of its knowledge base for improved performance, we select a specific case, namely the National Water and Sewerage Corporation (NWSC) in Uganda. This case was selected for the following reasons. First, since 1998, NWSC has implemented a series of internal institutional and managerial reforms that are reported to have created a major impact on its performance (Muhairwe, 2009; Mugisha, 2007b). For example, between 1998 and 2008 Non Revenue Water shifted from 51% to 33.5%, Service coverage from 47 to 72, whereas the number of staff per 1000 connections was reduced from 36 to 7 (Muhairwe, 2009). Second, the impressive performance of NWSC has increased its reputation nationally and internationally and it is currently recognized as a recent successful reformer (Mbuvi, 2012). At national level, the corporation was acknowledged as the most capable organization to manage water systems in Uganda and, as a result, the Ministry of Water and Environment (MWE) decided to progressively transfer most of the newly renovated small towns to NWSC (Nabakiibi & Schwartz, 2009). Different data collection techniques were used. Twenty interviews were conducted with staff members and managers at NWSC headquarters and 14 interviews in two service areas (Entebbe and Lugazi) using semi-structured protocols; we also conducted four interviews with members of NWSC local water committees. Besides, 16 interviews were held with representatives of key stakeholders, including donors, ministries, universities, consultants and contractors and civil society organisations. In addition to individual interviews, two focus group discussions (8 to 10 individuals) were organised with water consumers. The authors also consulted publications on the NWSC case, policy and administrative documents as well as archival records.

## Results and discussion

### Change management: the NWSC way to turn knowledge into action

NWSC is a public utility that was established in 1972. It is responsible for the provision of water and sewerage services in large towns under its jurisdiction. As of 2013, NWSC is operating in 28 towns which jointly have a population of 3.8 million people, with a service coverage rate of 78% (MWE, 2013). The corporation has a head office and service areas, with a total of 1770 staff. The former carries out activities relating to large-scale investments, asset management, operations support, and performance monitoring. The service areas are responsible for the day-to-day operations management in towns through structured internal incentive contracts, and they enjoy a certain level of operational autonomy. The head office signs a performance contract with the MWE, which also regulates the sector. Until 1998, the working environment and performance of NWSC did not differ much from most public water utilities in developing countries. Nevertheless, according to many interviewees, NWSC's major problem was not a lack of knowledge, but the application of knowledge. In the same vein, Muhairwe (2009) argues that when he became the Chief executive of NWSC in 1998, the corporation had a strong cadre of professional staff with sound theoretical and practical knowledge, necessary to successfully manage water services. However, these competences had not been fully utilized and the challenge for him was to mobilize them and bring them to fruition. As of 1998, NWSC was under new leadership (new managing director and a new board of directors) and started implementing a series of change management programmes that aimed at bridging the longstanding knowing-applying gap.

The 100-Days Programme (1999) was a pilot project aiming at improving the public image of the corporation. The Service and Revenue Enhancement Programme - SEREP (1999 - 2000) was designed to consolidate previous achievements. The Area Performance Contracts - APCs and Support Services Contracts - SSCs (2000-2003) were developed to address the targets set out in the first performance contract signed between NWSC and the government. They focused on increased autonomy of service areas and support departments, enhanced commercial orientation, result-output oriented management and performance incentives. The Stretch-out Programme (2002-2003) emphasized teamwork and reduction of distances

between hierarchical categories of employees. The One-Minute Management Programme (in 2003) came to correct the weaknesses observed in Stretch-out, which consisted of emphasizing group recognition at the expense of individual recognition. The Internally Delegated Area Management Contracts (IDAMCs) in (in 2004) transformed service areas into quasi-private, autonomous business units by giving them maximum autonomy and responsibilities. They also introduced competition for the right to manage a particular service area. The Checkers System (in 2005) was introduced to cope with the challenges of monitoring IDAMCs. It consisted of unannounced visits - but based on known and agreed-upon benchmarks - to monitor what happens on ground. Currently, the Performance, Autonomy and Creativity Enhancement Contracts (PACE) are being implemented and they are an improved version of IDAMCs. A particular feature of the above programmes is that they were home-grown, i.e. they were devised by the top management staff of NWSA and their implementation was spearheaded by internally selected change champions (Mugisha, 2007a; Muhairwe, 2009).

### **Drivers of knowledge application**

This study has identified a number of factors that have allowed NWSA draw on its knowledge base for action, namely (i) knowledge-oriented leadership, (ii) awareness raising, (iii) careful measurement of performance, (iv) encouraging action learning, and (v) improved incentive structures and working conditions. Most of these factors relate to the above change programmes. They are discussed in turn below.

#### ***Knowledge-oriented leadership***

The analysis of the behaviour of the different NWSA leaders since 1998 reveals that they had a strong focus on knowledge generation and application. The development of new systems and managerial procedures through a participatory approach was a time consuming task, but the utility leaders allocated time to it in order to foster the application of available knowledge over time. The board of directors was also knowledge-oriented as it usually supported the implementation of the strategies suggested by the chief executive team for action (Muhairwe, 2009). During our interviews, most interviewees, especially in service areas, indicated that the leadership was willing to allocate the necessary resources for the implementation of drawn up business plans and the trial of innovations (e.g. pre-paid meters). However, they specified that in recent years, the head office has not been able to always satisfy the financial needs of service areas with respect to their ambitious plans. Our research indicates that NWSA leaders did their best to avoid the "not-invented-here" syndrome, instead adopting many concepts and ideas (stretch-out, one minute management, checkers system, etc.) from successful companies in the world (e.g. General Electric) to motivate the use of individual and organisational knowledge. The participatory approaches characterizing most of the programmes show that top leaders did not cling to their own ideas; rather, they welcomed and incorporated powerful insights from staff regardless of their position in the company. Among the interviewees, this approach is generally acknowledged to have fostered the self-confidence among staff members and increased their interest in using their competences for the utility's benefit. The knowledge orientation is illustrated also by many other initiatives at NWSA, including the creation of a Research and Development department, the allocation of an annual budget for capacity development activities, the creation of a monitoring and evaluation department, and the involvement of NWSA in "process" and "performance" benchmarking exercises, internally and externally.

#### ***Awareness raising***

Our empirical research indicates that before implementing organisational innovations, the top management at NWSA first ensured that most staff understood the underlying philosophy. This was achieved through a variety of mechanisms. Top managers generally assembled relevant literature on the new ideas and shared this with change agents and mid-level managers. They read about relevant case studies where the new approach had worked well and, through miniworkshops, they exchanged ideas about its eventual implementation and perceived challenges at NWSA. Once a consensus was reached to adopt these organisational changes, the rest of staff members were encouraged (sometimes forced) to also read the same literature. The top management leaders and other change agents ensured the dissemination of the reading material, at least among all those who could read and write. Tests were even organised to assess the level of understanding by staff about the new approach and the winners were rewarded. Some interviewees could recall some of the books the employees were encouraged to read. Most interviewees indicated that this approach allowed the entire workforce to adjust their attitudes regarding the importance of their own knowledge and how they could apply it to improve the utility's performance. In particular, they were convinced that an innovation that had succeeded elsewhere could work in their workplace as well.

### ***Careful measurement of performance***

From the very beginning of the change management programmes, the leadership of NWSC instituted a mechanism to measure success and failure. They selected a small number of strategic areas of their business and focused on key performance indicators (KPIs) that were easy to understand by regular employees. For example, in the first programmes, the KPIs included working ratio, cash operating margin, Non Revenue Water, collection efficiency and connection ratio (Muhairwe, 2009). The leadership also established a strong monitoring and evaluation system which measures not only improvements in the outcomes (through regular reports produced by service areas and head office departments) but also work processes (through the checkers' visits). The interviews indicated that the establishment of clear performance indicators and targets seemingly motivated employees and managers at all levels to organise themselves and to apply whatever knowledge they possess in order to meet their contractual obligations. Moreover, the utility promoted an internal performance benchmarking (a quasi competition) whereby service areas compare their performance with respect to the pre-defined targets. This benchmarking involves competition and learning because best performers are not only rewarded but also usually share experiences with losers on how they solve problems. In addition, NWSC conducts "process benchmarking" (Mugisha et al., 2004): experts at headquarters compare water processes across areas and share new knowledge with service area managers about how things can be improved. The external services provided by the corporation to other utilities in the East African Region (and beyond) are also an opportunity to compare NWSC performance and processes to those of other utilities, to learn from them and perform better.

### ***Encouraging action learning***

Action learning refers to situations in which active learning on specific work-place challenges is enabled through coaching and peer learning, creating a safe learning environment that allows for making, and learning from, mistakes. On the one hand, NWSC adopted a learning-by-doing perspective to ensure that knowledge is actually used. The change agents (and occasionally experts from outside) usually accompanied local managers and their staff in the implementation process of new innovation (such as developing service area business plans) through coaching, which facilitated the turning of knowledge into action. The change agents were very dedicated because they were teaching during real life situations, whereas learners were enthusiastic because they were learning through direct involvement. The learning-by-doing approach is also illustrated by the apprenticeship, internal learning transfers and induction programmes that are used at NWSC. The interviewees reported that many of the newly recruited young engineers are generally appointed in upcountry service areas where systems are less complex, so that they can learn better by solving real problems themselves. This strategy was adopted by NWSC because in large towns, the urgency to fix problems is so high that whenever a problem arises, experts quickly address it, leaving little room for less experienced staff to learn from concrete problem solving. It is also important to note that throughout the change programmes, NWSC leaders laid more emphasis on acting which created opportunities for learning-by-doing. Indeed, after obtaining sufficient indication that an idea was worth implementing, the leadership jumped into action to test it in real life and then adapted or adjusted it as needed. All new ideas, principles, structures, systems, etc. that were introduced, were first quickly tried out (mostly in pilot sites) and then scaled up, once grounded experience was gathered.

On the other hand, top leaders at NWSC increasingly undertook a number of initiatives to reduce fear across the utility, which was a strong limiting factor for learning. This is an issue in many African cultures more than in Western cultures. Fear generally prevents employees not only from sharing their views with superiors, but also from applying new knowledge in ways that defy established routines, especially because employees may risk their job in case the implementation fails. For example, they attempted to 'reduce the distance' between managers and regular staff, at least in terms of relationship, by promoting participatory methodologies in planning processes. By means of the so-called "work out" sessions, managers and subordinates increasingly collaborated in the diagnostic of the problems facing their service areas and departments as well as in devising the strategies to address them. The guiding principle was that they should discuss ideas and activities without fear of blame or persecution. This atmosphere of participation was generally acknowledged as having strengthened the self confidence of staff at all levels. Our interviews revealed that employees generally feel free to speak their mind, (although some interviewees indicated that lower level employees are generally more open to criticism than high level staff members) and do not have fear to lose their jobs as a result of sharing their views and experience with colleagues. Furthermore, a culture of risk taking is encouraged at NWSC. For example, it was reported that during the first years of the programmes, area managers used to take risky decisions such as disconnecting military barracks or powerful

authorities. When the area managers got jailed for this, the managing director would lobby to get them released as soon as possible. Likewise, the contractualisation framework is generally recognized as having allowed people to make mistakes while applying their knowledge, which has fostered a culture of action and learning. Indeed, as service area managers and staff are encouraged to negotiate management contracts with ambitious targets<sup>1</sup> (or stretch targets), they are also given some room to make reasonable mistakes. Since failure to meet the stretch targets does not always attract penalties, people enjoy the opportunity to learn from their mistakes. Finally, the utility has implemented the concept of "open offices" which improved the mutual exchange of knowledge, as managers sit next to their subordinates.

### ***Improved incentive structures and working conditions***

Firstly, NWSC implemented soft competition strategies that emphasized learning and stimulated action. The leadership of NWSC avoided hard competition among its individual staff members and teams (service areas, departments, etc.) that would hamper cooperation and learning processes. Instead, efforts were undertaken to recognize individual and group efforts through appropriate performance incentives (such as cash awards, employee recognition, trophies). In doing so, the leadership acknowledged, i) that performance results from a collective effort but also, ii) that the benefits should be shared equitably. Secondary, over the years, salaries at NWSC have generally increased as a result of the change programmes, despite the large gaps that still characterize the salary scales. The interviewees indicated that their salaries are currently much better than in many of other public sector institutions in Uganda. In addition to the regular pay, the utility has introduced monetary performance-based incentives that have been adjusted over the years to take into account the contribution of individuals to group achievements. In particular, under the IDAMCs and PACE programmes, more attractive incentive packages with fixed incentive formula were introduced, allowing each service area to negotiate its incentive package depending on its business case (Muhairwe, 2009). Furthermore, the utility has improved the physical working conditions in all its service areas and the head office, by renovating facilities and purchasing necessary equipment and materials. The interviews suggest that the introduction of monetary and non-monetary incentives has triggered learning processes, since staff at all levels increasingly seem to perceive that their competences and contributions are valued. Finally, the interviewees reported that NWSC has introduced a fair health insurance for all staff members, without distinction, which increased their level of loyalty and commitment and motivated them to learn and apply knowledge for the benefit of the corporation.

### **Conclusions**

Two main conclusions emerge from this study. First, water utilities in developing countries and their partners are very right in pointing out that more knowledge and capacity is needed to boost utility performance. However, they should also acknowledge that part of the reasons underlying poor performance is the weak application of knowledge and capacity that is already at their disposal. This paper has shown how the turnaround of NWSC's declining performance trends has essentially relied on a systematic mobilisation and application of an already existing knowledge base, due to improved management and governance competences. The change management programmes were devised and spearheaded by managers and staff members who had been in the corporation for years. The programme consisted of establishing appropriate conditions that enabled employees to turn their competences into action. Therefore, it can be argued that it does not make much sense for water utilities to continuously train professionals and managers if, subsequently, the conditions prevent this knowledge to be put to actual use. Still, it may be better policy to have over-capacity than too little. Our research has shown how crucial the role of top management and other change agents is in pursuing a number of crucial changes to create beneficial conditions for the use of existing knowledge and experience. This requires a conducive accountability frame in which management operates; knowledge and capacity regarding how to introduce knowledge management procedures; and personal leadership for water sector capacity development (Lincklaen Arriëns and Wehn de Montalvo (2013). Second, it may be a reasonable target for water utilities to embark on the creation of new approaches to solve their knowledge management problems. However, this paper has demonstrated that many of the knowledge management-related challenges can be solved by imitating or adapting what has worked well in other sectors. The corporate sector offers plenty of practices that could be applied directly to the management of knowledge in water utilities.

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<sup>1</sup> In NWSC they make a distinction between "performance targets" (the ones that must be met if an area is to receive a management fee) and "stretch targets" (beyond performance targets) which determine performance incentives.

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