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

**An assessment of the WEDC conference papers
and their contribution to the WASH knowledge base**

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Depending on the level of technological advancement knowledge has always been shared and passed on from one generation to the other using different modes such as oral tradition and writings. Since the success of any organisation in the society depends on what knowledge it holds, many corporate organisations are embracing knowledge management programmes in order to improve their performance. The WASH sector is one sector where the application of knowledge management is being appreciated. This paper addresses some key issues on knowledge management in relation to the WASH sector and highlights the key findings of a research conducted to assess the WEDC international conferences and their contribution to the WASH Knowledgebase.

Introduction

We live in a global information economy where knowledge is considered a key driver of development. Whereas knowledge is taken to be a multifaceted notion with varied meaning, it is evident that it is acknowledged to be a major production factor which underpins the success of individuals, corporations, regions and nations (Styhre, 2003; Nonaka, 1994). For many organisations knowledge is recognised as a corporate asset critical to an organisation's survival, competitive success and a manager of change (Desouza and Paquette, 2011; Huseman and Goodman, 1999). In recognition of the significant role played by knowledge in organisational performance, many companies are engaging in Knowledge Management (KM) initiatives as part of their corporate strategies. As part of their KM initiatives, organisations are actively engaging in creation, storage, transfer, sharing and application of Knowledge which are considered to be the main components of Knowledge management process. It is the capture, processing, storage and maintenance of large amounts of information about products, people, processes and policies that leads to creation of knowledgebase which can be a source of materials for problem solving, decision making and a powerful repository of knowledge for organisational best practices and shared forum for competitive intelligence (Groff and Jones, 2003).

With the advent of advanced technology the collection, analysis, interpretation and storage of data have been easy and cost effective leading to generation of huge information databases and knowledgebase by organisations (Olafsson et al, 2008). With such large repositories of knowledge it is imperative that organisations categorise and prioritize the information they receive as the value of knowledge is dependent upon its timeliness, accuracy and relevance to the user as pointed out by Desouza and Paquette (2011). To maximise this value, organisations need to adopt what Groff and Jones (2003) refers to as 'an information triage' in order to gain a competitive edge in the business world.

Knowledge management (KM) and the WASH sector

WASH is a terminology which features in the international development agendas and whose focus is on development projects related to the provision of water supply, sanitation and promotion of hygiene practices. Whilst KM in project based organisation is shown to be a challenge due to the temporary nature of projects (Love et al., 2005) the relevance of KM in the sector cannot be underestimated as it would play a crucial role

in improving the sector's performance. Moreover its application would reduce the risk of 'reinventing the wheel' and provides an opportunity to learn from experiences of past projects (Anumba and Khan, 2003).

With many stakeholders engaged in WASH related activities large collection of literature in forms of reports, books, magazines, factsheets, editorials and conference papers relating to the areas of their interest have been produced. Whilst much has been written, most of the publications have not been subjected to the formal publication process hence the sector lacks a clear publication pathway focusing on WASH literature.

Although the WASH knowledge has been acknowledged to be scattered, in 2010 the IWA launched a peer-reviewed WASH journal entitled '*The Journal of Water, Sanitation and Hygiene for Development*'. Like WEDC, the Journal's emphasis is on dissemination of WASH knowledge for low and middle income countries. However, WEDC has a wider and unique body of WASH knowledge developed over the past 41 years in form of books, academic papers, technical notes, briefing notes, fact sheets, booklets, manuals and conference papers. For 35 years, the centre has organized international conferences with 2,347 papers having been presented to date. However, the contribution of this wide knowledgebase to the WASH sector is not known as there is no notable study which has been conducted on this repository of knowledge. It is in view of the above that this study was undertaken.

Methodology

An in-depth review of 2,347 conferences papers was conducted. The approach taken was mapped on to five periods based on major global initiatives addressing water and sanitation issues which were assumed may have had an influence on issues addressed in the conferences. The five time periods used are:-

1. The period before the International Decade of Clean Drinking Water (IDCDW) or the First Water Decade. This covers all the conferences that were held between the years 1973 and 1980.
2. The International Decade of Clean Drinking Water (IDCDW) or the First Water Decade. This covers all the conferences that were held between 1981 and 1990.
3. The period between 1991 and 2000 or the Post Water Decade Period.
4. Period after the United Nations (UN) Millennium Summit held in 2000. This is the period between the years 2001 and 2004
5. The Second International Water Decade which is the period between 2004- 2015

The data was extracted qualitatively through document analysis of 2, 347 conferences papers accessed online, 32 hardcopies of edited conferences' proceedings held between 1973 and 2006, and three DVDs copies of the conferences' proceedings held between 2008 and 2011. The investigation was descriptive in nature. Despite the problem of the credibility of the criteria chosen in categorizing the data, the qualitative approach was still adopted as it is known to be stronger on long descriptive narratives than on statistical tables by definition (Silverman, 2000).

Key findings

History and organisation of WEDC international conferences

The history of the WEDC International Conferences dates back in 1973 after the idea was conceived by the founder of WEDC the late professor John Pickford. The organization of the conferences is done by a committee from WEDC in conjunction with a local organizing committee (LOC) from each of the host countries. Other committees that have been behind the success of the conferences include an advisory committee drawing its membership from different backgrounds and countries and a scientific committee which assesses the quality of the papers before they are approved for presentation.

Host countries

A total of 35 conferences have been co-organized and held in 19 different countries. Out of the 35 conferences held, 15 of them (43%) have been hosted in Africa, 13 (37%) in Asia and 7 (20%) in the UK. The host countries have been Bangladesh, England, Ethiopia, Ghana, India, Kenya, Lao Democratic People Republic (Lao DPR), Malawi, Malaysia, Nepal, Nigeria, Pakistan, South Africa, Sri Lanka, Tanzania, Singapore, Uganda, Zambia and Zimbabwe. The first five conferences held from 1973 to 1979 were in Loughborough University of Technology (UK). The sixth conference was held in Zaria (Nigeria) in 1980 making it the first African country to host the conference while India was revealed to be the first Asian country to host the eighth conference in 1982. In 1981 the seventh conference was once again held in

Loughborough (UK), subsequently, the rest of the conferences were either held in Asia or Africa until 2011 when the 35th conference was once again held in Loughborough. Whilst each of the WEDC conferences is meant to be an annual event no conferences were held in the years 1974, 1978, 2007 and 2010. The countries which have repeatedly hosted the conferences are UK, India and Nigeria with seven, five and three conferences being held in each country respectively. Ethiopia, Ghana, Sri Lanka and Uganda have each hosted the conference twice while the rest of the countries stated above have each held the conference once. India stands out as the leading host country among the developing countries with 14.2% of the conferences being held there.

Conference participation and paper presentations

The conferences have attracted a participation of 9,579 delegates and 2,347 papers presentations as indicated on table 1. Out of the 9,579 participants 5,948 (62%) were local delegates while 3,631 (38%) were overseas. The conferences held between the years 1973-1981 recorded a low turn up with each conference attracting less than 100 delegates. Subsequently there was a significant increase in the level of participation, although the rise was not linear, as each conference held recorded a participation of more than 100 delegates. The conference with the highest level of participation in the history of WEDC conferences was the 34th on 'Water, Sanitation and Hygiene: Sustainable Development and Multi-sectoral

Period	Number of conferences held	Local participation	International participation	Total participation	Number of papers
1973- 1980 (Pre-Water Decade)	6	306	157	463	73
1981- 1990 (The Water Decade)	10	851	595	1446	323
1991-2000 (Post Water Decade)	10	2405	1336	3741	936
2001- 2004 (Post UN Millennium Summit)	4	1281	649	1930	475
2005 – 2015 (Second Water Decade)	5	1105	894	1999	540
Total	35	5948	3631	9579	2347

Approaches' held in Addis Ababa - Ethiopia in 2009. Out of the 645 delegates in attendance, 373 (57.8 %) were local delegates and 272 (42.2 %) were international. The same conference recorded the highest level of international participation of 272 delegates. Conversely, the conference that recorded the lowest attendance was the 1st one held in Loughborough in 1973. Apart from the conferences held in 1979, 1984, 1987, 1991, 1994 and 2011 which attracted more international participation than the local, the rest of the conferences (85.7 %) recorded high attendance from the local delegates. Most of the participants came from low and middle income countries. Africa attracted the highest number of participants as it hosted 4,676 delegates followed by Asia with 4,184 and UK 719 delegates. UK had the highest number of participants from high income countries most of whom were affiliated with WEDC.

During the initial stages of the WEDC conferences less than 10 papers in each of the conferences held between 1973 and 1980 were presented. Thereafter the number increased significantly with the highest number of papers (145) being presented during the conference on 'Sustainable Environmental Sanitation and Water Services' held in Kolkata-India in 2002. The conference which attracted the least number of papers (four) was held in Loughborough 1973.

WEDC conference themes and emerging topical issues

Each of the conferences held focused on a different title or theme. The conferences held between 1973 and 1980 focused on issues relating to environmental health, waste, water and wastewater mainly from an engineering perspective with an emphasis on planning, designing and construction of water supply and distribution. Thereafter the conferences focused on issues relating to sustainable provision of service delivery as reflected on papers addressing issues on community participation and management, institutional issues, operation and maintenance, cost recovery and financial management. Water emerged to be the most featured issue on four of the conferences themes addressed during this period.

Besides water and sanitation issues which remained integral elements of the conferences' themes held between 1981 and 1990, other issues that were highlighted were on waste and provision of rural and urban services in relation to people's wellbeing and development. Between 1991 and 2000 the focus was on provision of infrastructure, water and sanitation systems with an emphasis on integration of management, environmental and development issues in the provision of WATSAN services. The issue on hygiene featured for the first time in 2000 and challenges involved in the provision of WATSAN services were also highlighted. Matters on achievement of the Millennium Development Goals (MDGs), promotion of public health, people systems and sustainable environmental sanitation were key thematic issues four years after the Millennium Summit held in 2000. Finally from (2005- 2015) the thematic issues were on access to safe water and sanitation, different approaches to sustainable development of WASH services and the future of WASH in low income countries in the face of a changing world.

Different topical issues or subthemes emerged from each of the main conference themes as featured in different papers presentations. Some of the emerging topical issues were on: - water resources and supply, environmental sanitation, irrigation, pollution control, built environment, community women and NGOs, public health, sustainable service provision, knowledge management, planning for infrastructure, partnership, hygiene promotion, technical and cross cutting issues. The topical issues which featured in most of the papers presentations were: - water resources and supply, environmental sanitation and sustainable service provision. The least featured topical issue was on built environment.

Discussion

Despite the four years gap in the conferences' trend, it was evident that WEDC has made a long history and established a sustained conferences trend of bringing together different stakeholders in the WASH sector to share their experience for the last 35years. While it was not possible to establish the sectors from which each participant came from, based on the available information it was evident that the participants were researchers, policy makers, and practitioners working in government bodies, private sector, NGOs and international organizations all engaged in WASH- related activities.

The integration of a LOC from each of the host countries in the planning and organization of the conferences is such a commendable act and should highly be appreciated as it can be seen as one way through which the members of the host countries can identify themselves with WEDC conferences. Moreover, it would encourage more local participation in future conferences thus contribute to the sustainability of the WEDC conferences' trend.

It would be expected that the conferences should have been hosted in almost 35 countries coinciding with the number of years the conferences have been held nonetheless only 19 countries had hosted the conferences. This trend could be explained by the fact that some countries had hosted the conferences more than once. This kind of a trend can be seen a setback to WEDC as it restricts the boundaries of its influence. It was evident that the hosting of the conferences had a geographical orientation. For example the 15 conferences held in Africa have been hosted in 10 countries mainly in eastern, southern and western Africa while none of the countries in northern and central parts of Africa have hosted any conference. If WEDC has to expand its geographical influence in middle and low income countries the need to adopt a different approach in the choice and selection of host countries becomes paramount.

The low participation level and least number of papers presented between 1973 and 1979 could be attributed to the fact that the WEDC international conference was still in its embryonic stage. However as the conferences became more established and popular the level of participation and number of papers' presentations increased considerably. It can be argued that proximity to the host country had a direct influence on level of participation as more participants were shown to be drawn from the neighbouring countries. With such a high participation level then it would mean that more knowledge would be shared and there would be more to learn from all participants who have different experiences in the WASH sector.

The knowledge gained would be diverse and rich as it will be drawn from different regions with unique experiences specific to their region as WASH problems differ over space and time.

While the Dublin Statement on Water and Sustainable Development acknowledges that women play a significant role in the provision and management of water supply and are also known to bear the greatest brunt of lack of access to adequate water supply and improved sanitation, their participation at the conferences was under represented. However, the few who have attended the conferences their contribution can be appreciated through the papers which they were shown to have authored.

Although currently the water and sanitation challenges may not be the same as they were 35 years ago or before the inception of the WEDC conferences due to the social, demographic, economic and technological changes taking place in the world, the bottom line still is that access to water and sanitation still remains a daunting challenge for most of the developing countries. What has changed is the approach used in addressing the problems, an approach that puts into consideration all the social, economic, technological, environmental and institutional factors that would influence service delivery. This is reflected in the papers whose focus was on topical issues such as community participation, institutional issues, finance and cost recovery, technology, environment and development.

The topics of special interest such as supply of water and sanitation services during emergencies and provision of WASH services to vulnerable people such as the disabled, the elderly and children is an indication of an all-inclusive approach to service delivery one that puts into consideration the physical and social needs of the service users despite the fact that not many of the papers had been presented on this topic.

The choice of conferences' themes and topical issues emerging from the discussions seemed to have been influenced by major WASH related global initiatives such as: - the launch of the First and Second Water Decades, 1992 UN Conference on Environment and Development, 2000 UN Millennium Summit on MDGs, 2002 World Summit on Sustainable Development, and the launch of the Global WASH Campaign in 2001. For instance during the International Drinking Water Supply and Sanitation Decade there was the emphasis on community participation in WATSAN projects which was reflected in papers presentations which addressed topical issues on community participation and management. All of these initiatives aimed at scaling up efforts in improvement of WASH services.

Contribution to the WASH knowledge base

With a track record of 35 years' experience of bringing together 9,579 participants from different countries, WEDC conferences stand out as one of the most significant global forums in which researchers, policymakers, professionals and practitioners in the WASH sector have met and shared their experiences. With such a high level of participation and sustained conferences trend, undoubtedly, there is much learning which has taken place through the exchange of knowledge and shared experiences among the participants. The 2,347 papers, documenting the different experiences and knowledge that were shared in the conferences, acts as a large repository of WASH related issues that can be accessed online globally by any interested WASH stakeholder from the WEDC conferences' website. Besides reference to the proceedings of the 30th to 35th conferences can also be made from the copies of DVDs availed to each of the conferences' participants. The fact that the papers presented were shown to be either refereed or reviewed demonstrates that the credibility of the papers is unquestionable hence the type of knowledge shared would be considered being of very high quality. Thus it can be argued that through the conferences the WASH knowledgebase has continued benefiting and is being enriched with knowledge that is of high quality thus WEDC acts as a spring that would continue feeding the sector with useful information which is current and relevant to the changes taking place in the environment and that is able to meet the needs of the society.

While it was evident that the problems experienced in the sector are varied drawing from the case studies and experiences that were shared the lesson learnt is that these problems can be addressed through the adoption of different approaches that would be appropriate to the geographic region. Thus WEDC conferences have created and increased the awareness that there are different approaches that can be adopted in finding sustainable solutions to WASH problems.

Besides taking a multidisciplinary approach to WASH problems, WEDC conferences have not only put into context what has been happening in the global agenda by addressing issues that have been of major concern in the development agenda such as the MDGs but have also focused on issues affecting the local community at grassroots levels. This was addressed in the conferences that focused on issues such as rural water supply, country reports, urban and rural infrastructure.

The conferences have made some technical or technological contribution by showing how appropriate technology can suitably be used to address WASH challenges. This was demonstrated through emerging topical issues such as low cost sanitation technologies, appropriate water and waste water technologies.

Conclusion

The aim of these conferences has been the creation of a platform whereby practitioners, researchers, policy makers and all stakeholders in the WASH sector can meet and share their experiences and exchange knowledge in the sector. Undoubtedly WEDC has fulfilled its mission for it was shown to have established and maintained the conferences trend for the last 35 years. All the papers presentations seemed to address issues that were relevant at the time each of the conferences was presented. For example issues on community management may have been influenced by the Dublin principle whose emphasis was on the use of participatory approaches to water management. It can therefore be concluded that the conferences, through the large collection of papers presented, have contributed significantly to the WASH knowledgebase. However, in the midst of such a rich source of knowledgebase the question that needs to be addressed is how such knowledge can be leveraged in order to ensure that learning is enhanced within the sector?

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