# **33rd WEDC International Conference 2008**

Accra, Ghana 7-11 April 2008

ISBN: 978-1-60560-786-3

#### Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 www.proceedings.com

Some format issues inherent in the e-media version may also appear in this print version.

Copyright<sup>©</sup> (2008) by the Loughborough University of Technology All rights reserved.

Printed by Curran Associates, Inc. (2009)

For permission requests, please contact the Loughborough University of Technology at the address below.

Loughborough University of Technology Loughborough, Leicestershire, LE11 3TU United Kingdom

Phone: +44(0)1509 263171

postmaster@lboro.ac.uk

# Environmental Sanitation - Practitioner (REVIEWED)

Scaling up sanitation delivery: The perspective of community water and sanitation agency Theodora Adomako - Adjei, <i>Ghana</i>	3
Water and sanitation problems in selected schools in Ibadan, Nigeria G. R. E. E. Ana, E. O. Oloruntoba, M. K. C. Sridhar & A. Adekolu, <i>Nigeria</i>	8
Management of Sewerage System: Case Study in Tema E. Awuah, E. Donkor & E.K.M. Sanjok, <i>Ghana</i>	. 13
Performance evaluation of the UASB sewage treatment plant at James Town (Mudor), Accra E. Awuah & K. A. Abrokwa, <i>Ghana</i>	20
Using SEA principles to improve application of landfill guidelines in Ghana E. Darko-Mensah & L. Y Salifu, <i>Ghana</i>	27
Creating acceptable, affordable and appropriate sanitation options for rural areas B. A. Darteh & E. K. Appiah, <i>Ghana</i>	. 31
Access to Water and Sanitation in Ghanafor Persons with Disabilities: Findings of a KAP survey I. Drafor, <i>Ghana &amp; H. Jones, UK</i>	. 36
A new global sanitary revolution: lessons from the past Ben Fawcett & Maggie Black, <i>UK</i>	41
HCES: A new approach to environmental sanitation planning for urban areas C. Luthi & E. Tilley, <i>Switzerland</i>	. 46
The dilemma of sanitation coverage in Ghana Mumuni Fati, <i>Ghana</i>	. 50
Shame, humiliation and hazard: Tribulations of the girl child in Kenya Caroline Gathoni Mungara, <i>Kenya</i>	. 54
Appropriate capacity development towards effective faecal sludge transport in cities of low-income countries A. Nkansah, <i>Ghana</i>	58
Think globally, act locally: Community action planning critical to attaining global sanitation targets B. Onabolu, J.Bukkuyum & G. Onyilo, <i>Nigeria</i>	. 63
<b>The Nigerian girls education project: Giving the girl child a voice</b> G. Onyilo, B. Onabolu, F. Mohammed & A.Gege, <i>Nigeria</i>	67
Integrating environmental sustainability into the water and sanitation sector: Lessons from tsunami disaster response J. J. Randall, A. Navaratne, E. C. Rand & Y. Hagos, USA	. 72
All people, all access: WATSAN for disabled people in Mali T. J. E. Russell, UK	
An investigation into linkages between tenure and urban sanitation development P. Scott, <i>UK</i>	
WATSAN in partnership with NGOs and communities of Nepal Ramesh Kumar Sharma, <i>Nepal</i>	. 88
Groundwater quality, sanitation & vulnerable groups: Case study of Bawku East District B. M. Tiimub, A. M. Forson & K. Obiri-Danso, <i>Ghana</i>	. 93

# Environmental Sanitation - Scientific (REFEREED)

Faecal sludge management in Accra, Ghana:strengthening links in the chain N. L. D. Boot & R. E. Scott, <i>UK</i>	
Prejudices and attitudes toward reuse of nutrients from urine diversion toilets in South Africa L. C. Duncker & G. N. Matsebe, <i>South Africa</i>	
Performance of private companies involved in urban solid waste management: Evidence from three cities in Ghana S. Oduro-Kwarteng, <i>Ghana &amp;</i> M. P. van Dijk, <i>The Netherlands</i>	114
Quantitative microbial risk assessment of wastewaterand faecal sludge reuse in Ghana Razak Seidu, <i>Ghana</i> , Pay Drechsel, Philip Amoah, Owe Löfman, Arve Heistad, Madeleine Fodge, Petter Jenssen & Thor-Axel Stenström	121
Role of advocacy campaign to achieve sustainablerural sanitation reform A. N. Singh, <i>India</i>	
<b>Equal access for all?: Issues for people with HIVand with disabilities in Ethiopia</b> Mahider Tesfu & Priscilla Magrath, <i>Ethiopia</i>	

# Institutional Issues - Practitioner (REVIEWED)

A global community of practice: creating resource centres that build capacity in local WASH service provis. P. J. Bury, <i>The Netherlands</i>	
Approaching community-level greywater managementin non-sewered settlements in South Africa K. Carden, K. Winter, A. Spiegel & N. Armitage, <i>South Africa</i>	150
<b>"Use now, pay later", An innovative approach to increasing access to improved latrine facilities in Ghana</b> Oduro Donkor & Benjamin Arthur, <i>Ghana</i>	154
Power of knowledge in executinghousehold water treatment programs globally C. Dow Baker, L. Rolling, R. Martinez, A. Baryar, G. Bulos & M. Lipman, <i>Canada</i>	157
<b>Drinking water policy, water rights and allocation practice in rural Northern Ghana</b> I. Eguavoen, <i>Germany</i>	161
African water: Supporting African involvement in the EU framework programme H. Houghton-Carr, A. Crowfoot, J. Fisher, E. Karar, K. Pietersen, N. Runnalls, I. Smout & T. Zipper, UK	166
Monitoring of water and sanitation committeesusing a performance assessment tool Ampadu-Boakye Joseph, Dotse Francis Mawuena & Laryea Nii Odai Anidaso, <i>Ghana</i>	171
Challenges in the implementation of district waterand sanitation plans in Ghana Ampadu-Boakye Joseph, Dotse Francis Mawuena & Laryea Nii Odai Anidaso, <i>Ghana</i>	177
Integrated resource planning:a vital tool for utilities in low-income countries Sam Kayaga & Ian Smout, <i>UK</i>	181
Decentralised intersectoral rural water supplyand sanitation provision: Lessons learned from Zambia C. Lungu & P. A. Harvey, Zambia	185
Formulation of WatSan policies in Pakistan Dr Murtaza Malik, Dr. Tameez Ahmad & Thowai Sha Zai, Pakistan	189
Institutional reform of water services providers in South Africa T. B. Matidza, <i>South Africa</i>	193
<b>Improving water and sanitation provision globallythrough information sharing</b> Martin Mulenga, <i>UK</i>	196

Capital cost contribution (CCC) to water projectsby rural communities J. Nedjoh & F. Soley, <i>Ghana</i>	201
<b>Operation and maintenance of small towns water supply systems in Ghana</b> Alexander Obuobisa-Darko & Simon Edem Asimah, <i>Ghana</i>	206
Women, water and sanitation – Challenges and prospects Laryea Nii Odai, Dotse Francis Mawuena, Fiasorgbor Doris & Ampadu-Boakye Joseph, <i>Ghana</i>	212
Taking people to water instead of taking water to people: Changes in Ghana's rural water sector Laryea Nii Odai & Dotse Francis Mawuena, <i>Ghana</i>	217
Hand pump maintenance training for rural water supply sustainability in Nigeria T. O. Olantunji, <i>Nigeria</i>	222
<b>Decentralised strategy setting and action planningfor environmental sanitation in Ghana</b> A. K. Opoku, L. Y. Salifu & E. Darko-Mensah, <i>Ghana</i>	226
Enhancing community-driven initiativesin urban water supply in Ghana I. K. Osumanu & L. Abdul-Rahim, <i>Ghana</i>	230
Mainstreaming SEA in water and environmental sanitation in Ghana L. Y. Salifu & E. Darko-Mensah, <i>Ghana</i>	234
Environmental sanitation assessment aidstown environmental sanitation planning L. Y. Salifu, K. M. Afful & E. Darko-Mensah, <i>Ghana</i>	238
Improving the environment in poor neighbourhoodsthrough community participation B. Shukur, <i>Iraq</i>	242
Water tariff setting and challenges for meeting watercoverage target of millennium development goals in G W. K. Siabi & P. E Pebla Tambro, <i>Ghana</i>	
Global strategic partnerships to share international and local expertise between private sector and NGOs M. Tindale, N. Swain, V. Coy & S. Parry-Jones, <i>UK</i>	252
Exploring implications of urban growth scenariosand investments for water supply, sanitation, wastewatergeneration and use in Accra, Ghana D. J. Van Rooijen & P. Drechsel, <i>Ghana</i>	257
Domestic water supply in Accra: How physical and social constraints to planning have greater consequences for the poor D. J. Van Rooijen, D. Spalthoff & L. Raschid-Sally, <i>Ghana</i>	
Institutional Issues - Scientific (REFEREED)	
Benefits distribution pattern of a WatSan program Javaid Ahmed, <i>Pakistan</i>	271
<b>Cycles in the ecological development of Valley View University, Accra, Ghana</b> Gunther Geller, <i>Germany &amp;</i> Seth A. Laryea, <i>Ghana</i>	279
<b>Post-construction supportand the sustainability of rural water projects in Ghana</b> Kristin Komives, Bernard Akanbang, Rich Thorsten, Benedict Tuffuor, Wendy Wakeman, Eugene Larbi, Alex Bakalian & Dale Whittington, <i>The Netherlands</i>	287
Affordability of basic services under conditionsof extreme inequality A. Matros-Goreses, <i>Namibia</i> & Richard Franceys & Paul Trawick	295
Learning alliances for integrated and sustainable innovations in urban water management Joep Verhagen, John Butterworth, <i>The Netherlands &amp;</i> Mike Morris, <i>UK</i>	

Politicising the World Bank's over-institutionalisedwater reforms in the developing countries	
S. Wong, UK	. 309
Water for development: Cost recovery and local development financing	
T. Yabi & J. Boko, Benin	.316

#### Water Resources - Practitioner (REVIEWED)

Lessons from emerging conflict resolution mechanismsin the Volta Basin B. Ampomah, <i>Ghana</i>	325
Integrated water resources management plan for Densu River Basin, Ghana I. Asamoah, S. Jacobi & B. Alfa, <i>Ghana</i>	330
Sustainable water security in the Thar Desert, India: Blending traditional wisdom with modern techniques Deepak Malik, India	335
Reflection of Dublin Principlesin rural water supply approaches in Zambia M. A. Munkonge & P. A. Harvey, <i>Zambia</i>	340
Improving water qualitythrough integrated water resources management A. Paintsil & R. Abrahams, <i>Ghana</i>	345

### Water Resources - Scientific (REFEREED)

Northern Ghana hydrogeological assessment project MA. Carrier, R. Lefebvre, J. Racicot, <i>Canada</i> & E. B. Asare, <i>Ghana</i>	53
Natural clarification of potable waterin a semi-arid catchment T. Kuypers, M. P. Taylor & A. Mackay, <i>Australia</i>	62
Visualisation of problems and solutionsto ensure access to water resource M. I. Poolman, <i>The Netherlands &amp;</i> T. Schuetz, <i>Ghana</i>	69
Possible water uses in mining lakes: Case study of Aguas Claras, Brazil E. v. Sperling & C. A. P. Grandchamp, <i>Brazil</i>	75

# Water Supply - Practitioner (REVIEWED)

Assessment of water supply and sanitationof some coastal communities of the Niger Delta Peter Cookey, <i>Nigeria</i> , Kokpan Baribuma Agnes, Aguo Miriam Richard, Wenes Weridongha &	
John Prince Chukwuemeka	
What's going on? Exploring drinking water practices as an outsider C. Furlong & C. A. Paterson, <i>UK</i>	
Community participation in rural water supply and sanitation projects, gender roles and realities: A case of Ward 22 in Chipinge district, Manicaland province, Zimbabwe L. Katsi, <i>Zimbabwe</i>	
Sustainability of rural water supplies through monitoring A. G. Koestler & L. Koestler, <i>Norway</i>	
Domestic water consumption: A field study in Harbin, China T Lu, China and I Smout, <i>UK</i>	403
Community Based Management for Sustainable Water Supply in Malawi Swithern Matamula, <i>Malawi</i>	407

Institutionalizing community led action for sanitary survey Vinod Kumar Mishra & Arvind Kumar Singh, <i>India</i>	
Water supply coping strategies in Accra K. B. Nyarko, S. N. Odai, P. A. Owusu & E. K. Quartey, <i>Ghana</i>	417
Self supply schemes for community water supply in Ghana K. Nyarko, E. Awuah & D. Ofori, <i>Ghana</i>	
Sustaining point-of-use (POU) water quality interventions in Ghana: The behavioural perspective Sumaila S. Saaka & Lonna B. Shafritz, <i>Ghana</i>	
Water supply systems in selected urban poor areasof Addis Ababa, Ethiopia S. K. Sharma & B. W. Bereket, <i>The Netherlands</i>	
<b>Community use of H<sub>2</sub>S (hydrogen sulphide)as a verification tool for water safety plans</b> Kelvin Shingles & Roberto Saltori. <i>Sri Lanka</i>	435

# Water Supply - Scientific (REFEREED)

Removal of fluoride from rural drinking water sourcesusing geomaterials from Ghana J. A. Ayamsegna, W. B. Apambire, N. Bakobie & S. A. Minyila, <i>Ghana</i>	441
Measuring behavioural outcomes when promoting household water treatment and storage Orlando Hernández, USA	447
Quality and sustainability aspects in water accessindicators: an example from Same District, Tanzania A. Jiménez & A. Pérez-Foguet, <i>Spain</i>	455
Results from household ceramic filter evaluationin northern Ghana Sophie M. Johnson, Rachel L. Peletz & Susan Murcott, USA	463
Importance of evaluating phosphate levels in tubewellsin high arsenic areas of Asia T. Mahin, T. Ngai, S. Murcott & M. Mondal, <i>Canada</i>	467
<b>Epidemiology of diarrhoeal disease in rural Malawi– a case study of cryptosporidiosis</b> T. D. Morse, <i>Malawi / UK &amp;</i> A. M. Grimason & H. V. Smith	474
<b>Characterizing the dissemination process of household water treatment systems in less developed countries</b> Tommy Ka Kit Ngai & Dr. Richard Fenner, University of Cambridge, <i>UK</i>	483
Viability of marginal yield boreholes in selected geological formations in Ghana M. C. Ofori-Agyeman, C. S K. Kpordze & G. K. Anornu, <i>Ghana</i>	490
Aeration and its application in groundwater purification W. K. Siabi, <i>Ghana</i>	495
The risks of a technology-based MDG indicator for rural water supply Sally Sutton, <i>UK</i>	500

# Poster Presentation Abstracts (REVIEWED)

Meeting the hygiene, safe water and sanitation needsof people living with HIV/Aids (PLWHA) Julia Rosenbaum & Kebede Faris, USA / Ethiopia & Andreas Knapp	. 509
Addressing the water and sanitation needsof primary schools: Experiences from East Africa G. Yap, A. Mirembe, V. Mucheni, T. Namata & S. Ouma, <i>Canada</i>	.510

# Special Interest Sessions (REVIEWED)

Demand management for sustainable urban water services in cities of developing countries	
S. Kayaga & I. Smout, UK ABSTRACT	515
SUMMARY OF PANEL DISCUSSION	
Panel Discussions: Extended discussion on specific issues (REVIEWED)	
Capacity building and innovations through joint learning: Experiences with Communities of Practice and Learning Alliances	
P. J. Bury & J. Verhagen, <i>The Netherlands</i> ABSTRACT	
SUMMARY OF PANEL DISCUSSION	
Pollution management in urban watershedsof developing countries	
Conveners: International Water Management Institute (IWMI);	
International Development Research Centre (IDRC)	
ABSTRACT	
SUMMARY OF PANEL DISCUSSION	
Regional partnership for decentralised sanitationand water delivery in 6 Countries	
M. A. Nashiru, J. Burton, Y. Malle & J. Lambongang, <i>Ghana</i>	
ABSTRACT	529
SUMMARY OF PANEL DISCUSSION	