

BASELINE NARRATIVE REPORTING DOCUMENT - KNUST

In lieu of the full baseline data collection exercise taking place, please complete the following reporting document. One overarching document for the whole consortium is preferred. However, if it is easier, we are happy to also accept one form per consortium partner.

While the document predominately uses a narrative reporting format, we have also included space for inclusion of any quantitative data that may be available. Please try to include as much quantitative data as possible.

In addition, the final part of the form requests publication and grants data relating to co-applicants (named personnel within the original bid document). These are vital for successful review of the progress of the African Institutions Initiative and we request that you provide as much data here as possible. Any queries regarding the forms should be sent to: r.e.hanlin@open.ac.uk

Please endeavour to return the completed form(s) to us by **30th November 2010**.

PART A: Capacity baseline

1. What was the situation with respect to scientific/ research related human resources capacity (research active staff, post-grads) within your relevant field of activity in your African partner institutions at baseline (September 2009)?

Narrative report:

- a) KNUST has research retreat platform where researchers make presentations on their papers.
- b) Quite a number of projects are also available for research works. They include the SWITCH project which provided funds for graduate research, UNESCO-IHE funds for MSc training and WASHCOST project for research in water and sanitation.
- c) The Civil Engineering department boast of highly qualified personnel in the water and sanitation section. Their areas of expertise cover water and wastewater treatment, solid waste management, water supply, health and hygiene related issues, research and project management, GIS related Services & Database Management and Hydrology and Water resources. Other areas are Climate Change, Water Resources Management/engineering and modelling, remote sensing, institutional and governance issues and financial management

Any additional supporting quantitative data:

At the Civil Engineering Department there were 3 Associate Professors, 1 professor, 5 senior lecturers and 9 lecturers. There were 29 students pursuing 2 MSc programmes in water and sanitation and 11 PhD students.

2. What relevant training courses/ programmes (for post-graduate teaching in particular, but also professional development) were available within the partner institutions at baseline (September 2009)? Please distinguish between courses/ programmes available in Northern institutions and African institutions if possible.

Narrative report:

- Relevant graduate programmes available at the Civil Engineering Department are: MSc. Water Supply and Environmental Sanitation, MSc. Water Resources and Engineering Management. The modules and their corresponding courses offered under these two programmes are:
 - a) **Introduction to Water Resources** : Integrated Water Resources Management, Meteorology and Hydrometry, Applied Hydraulics, Urban Hydrology and Urban Drainage

- b) **Mathematics and Research Methods** : Mathematics and Statistics for Water Engineers, GIS and Data Management in Water Systems, Research Methodology
- c) **Advanced Hydrology and Modelling** : Applied Hydrology , Hydrogeology, Water Systems Modelling
- d) **Environmental Quality** : Environmental Issues and Impact Assessment, Water Quality Management and Public Health
- e) **Water Resources Engineering** : Reservoir Development & Operation , Small Hydraulic Structures, Irrigation Engineering, Hydro-Power Development
- f) **Water Resources Management** : Water and Environmental Law, River Basin Management, Water Resources Planning
- g) **Management and Institutions** : Community Participation and Institutional Development, Water Project Management, Engineering Economy and Financial Management

Any additional supporting quantitative data:

3. What was the situation with respect to research management, governance and administration structures within your relevant field of activity in your African partner institutions at baseline (September 2009)?

Narrative report:

The Central University has a Research and Conferences Committee with the following membership:

- Vice-Chancellor, as chairman
- Pro-Vice Chancellor
- Registrar
- Principals of KNUST University Colleges
- Provests of Colleges
- Two Research Fellows appointed by the Academic Board not below the rank of Senior Research Fellow from the Research Centres
- Deputy Registrar (Human Resources Development)
- One member elected by each college, who is not below the rank of Senior Lecturer

The core functions of this committee subject to the approval of the Academic Board are:

- a) To formulate and publish the research policies and priorities of the University and to provide guidelines for the assessment of research proposals
- b) To examine and take appropriate action on all applications for grants chargeable to the Research and Conference Fund
- c) To receive and publish reports on research and conferences from Departments and prepare annually a comprehensive report for submission to the academic board.

Financial Governance and Payment procedures.

The governance of Grants is managed in accordance with three main regulations.

- The Finance and Administration Act 2003 (Act 654)
- The University's Finance and Stores regulations, and
- The Public Procurement Act, 2003 (Act 663).

School of Graduate Studies

This body is responsible for all students pursuing graduate studies. The school has a brochure that clearly outlines the entry requirements and general regulations for Graduate Programmes in the university. The general requirements cover applications and procedures for Admission, description of graduate studies and the award of a degree, procedure for complaint and redress among others.

Any additional supporting quantitative data:

4. What was the situation with respect to physical and ICT infrastructure within your relevant field of activity in your African partner institutions at baseline (September 2009)? Where any additional facilities based within Northern partner institutions regularly used by African partner institutions at baseline?

Narrative report:

- Central university has an ICT centre open to all students for research works
- Civil Engineering Department (Water and Sanitation Section) has an ICT centre for its graduate students though the facilities are limited.
- Civil Engineering Department also has Video conference facilities
- The Department has an Environmental Quality Laboratory for water and wastewater analysis.
- The Department lacks offices for scientific staff and graduate and MSc students.
- Besides the central university library, the College of Engineering runs its own library with over 12,000 books. In addition, the College of Engineering subscribes to over 13 international journals and receives occasional donations from some overseas institutions.
- The graduate school has a common room with access to internet for all graduate students
- The Graduate school has limited number of study rooms for students

Any additional supporting quantitative data:

PART B: Publication and grants situation

Please provide the following as additional annexes to this report:

- **A list of co-applicants' publications (for the last 10 years). Data should relate to both African and Northern institutions.**
- 1 Awuah E, Nyarko KB, Owusu PA and Osei Bonsu K (2009). Small towns water quality. *Desalination* 248 (1-3) 453-459
 - 2 Awuah E, Morris RT, Owusu PA, Sundell R, and Lindstrom (2009). Evaluation of simple arsenic removal from domestic water supplies in rural communities. *Desalination* 248 (1-3) 42-47.
 - 3 Nyarko KB, Awuah E, and Ofori D (2009). Local initiative in community water supply: Case study in Ashanti Region, Ghana *Desalination* 248 (2009) 450-457.
 - 4 Awuah E, Nyarko KB, and Owusu PA (2009). Water and sanitation in Ghana. *Desalination* 248 (2009) 460-467.
 - 5 Schafer AI, Rossita, HMA, Owusu PA, Richards BS, and Awuah E (2009). Physico-chemical water quality in Ghana for water supply technology implementation. *Desalination* 248 (1-3) 193-203.
 - 6 Coffie O, and Awuah E (2008). Technological and institutional innovation on irrigated urban agriculture in Accra, Ghana. *Urban Agriculture Magazine* No. 20 14-16.
 - 7 Odai S N, Mensah E, Sipitey D, Shoji R, and Awuah E (2008). Heavy metals uptake by vegetables cultivated on urban waste Dumpsites *Journal of Environmental Toxicology* 2: 92-99.
 - 8 Agbottah S, Awuah E, Cofie O, and Montange A (2007). Anaerobic treatment of percolate from faecal sludge. *Journal of the Ghana Institution of Engineers* Vol. 5 (1&2): 25-30
 - 9 Awuah E, Lubberding HJ, and Gijzen HJ (2007). Effect of Protozoa on Faecal Bacteria Removal in Macrophyte and Algal Ponds. *Journal of Engineering Technology* 1: 43-53.

- 10 Wilson A, Anyemedu FOK, Oduro Kwarteng S, and Awuah E (2006). Management of Medical Waste from Teaching Hospitals in Ghana. *Journal of Ghana Institution of Engineers* 4: 67-75.
- 11 Cofie O, Agbottah S, Strauss M, Esseku, Montangero A, Awuah E, and Kone, D (2006). Solid-liquid separation of faecal sludge using drying beds in Ghana: implications for nutrient recycling in urban agriculture. *Water Research* 40: 75-82.
- 12 Tetteh IK, Awuah E, and Frempong E (2006). Post Project Analysis: The use of a network diagram for environmental evaluation of the Barekese Dam, in Kumasi, Ghana. *Environmental Modelling and Assessment* 11: 235-242 (One of the ten best scientific Papers for the year award)
- 13 Awuah E, Oduro- Kwarteng S, Lubberding HJ, and Gijzen HJ (2005). Hydraulic performance of water lettuce, duckweed and algal-based stabilisation ponds. *Engineering Review* 1: 8-16.
- 14 Tetteh IK, Awuah E, and Frempong E. (2004). Development of a weighting system for use in environmental health impact assessment associated with water impoundment projects in Ghana and its application. *Journal of Ghana Science Association* 6: 59-70.
- 15 Tetteh IK, Frempong E, and Awuah E (2004). An analysis of the environmental health impact of the Barekese Dam in Kumasi Ghana. *Journal of Environmental Management* 72: 189-194.
- 16 Awuah E, Darteh B, and Sakyi P (2004). Women engaged in charcoal production; their environment and health. *Energy Review* May-July 54-62.
- 17 Awuah E, Oppong-Peprah M, Lubberding HJ, and Gijzen HJ (2004). Comparative performance studies of macrophyte and algal-based stabilisation ponds. *J. Toxicol. Environ. Health* 67 (Part A)1-13.
- 18 Awuah E, Asante K, Lubberding HJ, and Gijzen HJ (2002). Effect of pH on enterococci removal in *Pistia*, duckweed and algal-based stabilization ponds for domestic wastewater treatment. *Journal of Water Science and Technology* 45(1): 67-74.
- 19 Awuah E, Asante, K, Anohene F, Lubberding HJ, and Gijzen HJ (2001). Environmental conditions and pathogen removal in macrophyte and algal-based wastewater treatment systems. *Journal of Water Science and Technology* 44 (6) 11-18.
- 20 Buamah, R.; Petrusovski, B.; de Ridder, D.; van de Wetering, T.S. C. M. and Schippers, J.C. (2009) Manganese removal in groundwater treatment: practice, problems and probable solutions. *Journal of Water Science and Technology* 9.1, 89 – 98.
- 21 Buamah, R.; Petrusovski, B and Schippers, J.C. (2009) Oxidation of adsorbed ferrous: kinetic and influence of process conditions. *Journal of Water Science and Technology*, 60.9: 2353 – 2363.
- 22 Buamah, R.; Petrusovski, B. and Schippers, J.C. (2008) Adsorptive removal of manganese (II) from the aqueous phase using iron oxide coated sand. *Journal of Water Supply: Research and Technology – AQUA* 57.1: 1 – 12
- 23 Buamah, R.; Petrusovski, B. and Schippers, J.C. (2008) Presence of arsenic, iron and manganese in groundwater within the gold-belt zone of Ghana. *Journal of Water Supply: Research and Technology – AQUA* 57.7: 519 – 529
- 24 Awuah, E., Nyarko.K.B and Owusu P. A (2009). Water and Sanitation in Ghana. The International Journal of the Science and Technology of Desalination and Water Purification. Elsevier, Vol 248 Issues 1-3.
- 25 Oduro-Kwarteng, S., Nyarko. K.B., Odai. S. N and Aboagye-Sarfo P (2009) Water conservation potential in educational institutions in developing countries: case study of a university campus in Ghana. *Urban Water Journal*, Taylor and Francis,
- 26 Nyarko, K.B., Awuah. E and Ofori, D (2009) Local initiative in community water supply: Case study in Ashanti Region, Ghana . The International Journal of the Science and Technology of Desalination and Water Purification. Elsevier, Vol 248 Issues 1-3.
- 27 Nyarko, K.B. (2008), 'Private sector involvement in drinking water supply in Ghana', *Int. J. Of Water*, Vol. 4, No.3/4, pp.197–215.
- 28 Nyarko, K. B., Oduro-Kwarteng, S and Adama, I. (2007).“Cost recovery of community managed piped systems in Ghana”. *Water and Environment Journal* 21(2007) 92–99
- 29 Oduro-Kwarteng, S., Nyarko K. B., Odai, S. N. and Aboagye-Sarfo, P. (2009). Water Conservation potential in educational institution: Case Study of a University Campus in Ghana. *Urban Water Journal* 6(6), 449 – 455.
- 30 Adwubi, A., Amegashie, B. K., Agyare, W. A., Tamene. L., Odai, S. N., Quansah, C. and Vlek, P. (2009). Assessing sediment inputs to small reservoirs in Upper East Region, Ghana. *Lakes and Reservoirs: Research and Management*, 14(4), 279 – 287.

- 31 Annor, F.O., van de Giesen, N., Liebe, J., van der Zaag, P., Tilmant, A. and Odai, S. N. (2009). Delineation of small reservoirs using radar imagery in a semi-arid environment: a case study in the Upper East Region of Ghana. *Physics and Chemistry of the Earth* 34: 309 – 315
- 32 Odai, S. N., Mensah, E., Sipitey, D., Shoji. R., Awuah, E. (2008.), Heavy Metals Uptake by Vegetables Cultivated on Urban Waste Dumpsites: Case Study of Kumasi, Ghana. *Research Journal of Environmental Toxicology* 2(2): 92 – 99.
- 33 Mensah, E., Odai, S. N., Kyei-Baffour N., and Ofori, E. (2008). Influence of Transpiration on Cadmium and Lead Uptake by Cabbage, Carrots and Lettuce from Irrigation Water in Ghana. *Asian Journal of Agricultural Research* 2(2): 56 – 60.
- 34 Mensah, E., Allen H. E., Shoji, R. Odai, S. N., Kyei-Baffour N., Ofori, E., and Mezler, D. (2008). Cadmium and Lead Concentrations Effects on Yields of Some Vegetables due to Uptake from Irrigation Water in Ghana. *International Journal of Agricultural Research* 3(4): 243 – 251.
- 35 Mensah, E., Bonsu. M., Kyei-Baffour N., Ofori, E., Odai, S. N. (2008). Influence of Cadmium and Lead Concentrations of Irrigation Water on Dry Matter Yield of Vegetables. *Journal of Environmental Science and Technology*, 2(1), 68-72.
- 36 Oduro-Kwarteng, S., Nyarko, K. B., Odai, S. N., and Aboagye-Sarfo, P. (2007). Strategies for Improving Water End-Use Efficiency on KNUST Campus in Kumasi. *Journal of Engineering and Technology*. 1(1) 60 – 66.

- **A list of co-applicants' grants (if possible for the last 10 years, minimum requirement is 5 years). Data should relate to both African and Northern institutions.**

Project title	Role played	Funding (USD)	Funding Agency	Start year – end year
WSESP Capacity building for post graduate training in water supply and sanitation in Ghana	Support to proposal development	1.5million Euros	UNESCO-IHE	1996-2001
WRESP Capacity building for post graduate training in water engineering and environmental sanitation in Ghana	Director	1.5 Million Euros	UNESCO-IHE	2003-2008
WashCost This project seeks to examine the life cycle analysis of water and sanitation projects to determine the overall cost for planning purposes.	Facilitated implementation	1.5 million Dollars	IRC, Netherlands	2008-2013
SNOWS Is a consortium of 9 institution seeking to build research capacity in water supply, sanitation and environmental Health? This the consortium hopes to achieve by carrying out a needs assessment and organizing training for staff involved in research and provision of fellowships for PhD and Masters students to carry out research. It is a Welcome Trust funded project. The Institutions are London School of Hygiene, University of Copenhagen, East Anglia, Tshwane and Venda in South Africa, University of Egerton in Kenya, Mbarara in Uganda and KNUST in Ghana	Director	1million pounds	Welcome Trust	2009-2014
SWITCH This is a 33 partner Institutions from 15 countries with the aim of achieving more sustainable urban water management in the city of the future. They use innovative scientific, technological and socio-economic solutions, which can then be more speedily replicated around the world. It has research across six themes and these are paradigm shift to sustainable and integrated urban water management, storm water management, efficient water supply and use for all, innovations in sanitation and waste management, urban water environments and planning and Governance and institutional change.	City Coordinator/Scientific Director	13,million Euros	UNESCO-IHE Netherlands	2005-2010
CaPWA A water conservation project in industries. This involves the collection	Coordinator	62,000Euros	KEMA Netherlands	2010-2013

<p>of data on the energy and water conservation practices in industries in Ghana. A water capturing devise will be developed in counterpart institutions and presented in Ghana. A workshop will be organised to present results to stakeholders</p>				
<p>UPaRF Funds projects that have primary focus on water and sanitation. Pays for compensation for staff time, cost for ravel, consumables, Equipment, PhD and Masters Fellowships, Dissemination audit control and third party</p>		<p>100,000 Euros</p>	<p>UNESCO-IHE Delft Netherlands</p>	<p>2009-to date</p>