

Report On the 4th International Conference on Appropriate Technology
Amadi Sefah-Twerefour, Prosper Adiku, Linda Kpormone Buame & George Owusu Fordah

THEME: *'Appropriate Technology for Water and Sanitation: Solutions for a thirsty, Polluted Planet'*

HOST COUNTRY: GHANA

HOST SCHOOLS: African University College of Communications (AUCC), Accra-Ghana and University of Ghana, Legon, Centre for African Wetlands, Accra-Ghana.

DATE: November, 24-27, 2010.

SPONSORS: Howard University, USA; Northern California Council of Black Professional Engineers (NCCBPE); National Technical Association; Council for Scientific and Industrial Research, Accra-Ghana; Kwame Nkrumah University of Science and Technology, Kumasi-Ghana.

WEDNESDAY, 24TH NOVEMBER, 2010.

Opening Reception night at African University College for Communication (AUCC)

There was a cultural display inaugurate the event, followed by a word from the Chairman, John Trimble and the coordinator, Dr. Hattie Carwell and then before dinner a welcome address by Mr. Yankah, the president of AUCC.

Participants in the conference came from all over Arica (South Africa, Kenya, Zimbabwe, Nigeria, Ghana, Swaziland, Sudan) India, Guyana and the USA: Research personnels, stakeholders, students (from the University of Ghana, Legon, Ghana; Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; University of Lagos, Lagos, Nigeria and Howard University, Washington, DC, USA).

THURSDAY, 25TH NOVEMBER, 2010.

Welcome Address: Dr. John Trimble, Chair of the 4th ICAT International Planning Committee

Second Welcome Address: From the office of the Vice Chancellor

1ST Keynote speaker: Honourable Alan Bagbin, Minister of Water Resources, Works and Housing.

The minister highlighted on the scarcity of freshwater on the planet and uses of this scarce freshwater. He also talked about already existing conflict situations in the world over water citing Iran and India as examples. He was concerned about the role of technology and science in addressing these conflict situations and the importance of the appropriateness of any technology to the situation and area, stressing on a bottom up approach. Water conservation and designs for new housing systems (roof catchment and land catchment methods) were also captured in his address. He also talked about some pilot projects on going in the country presently and the value of

water to Ghanaians. He was of the view that Ghanaians needed to have a mindset change about spending money to get access to clean and safe drinking water.

Quotes:

"Charity begins at home"

- Bob Marley

"In the abundance of water the fool is thirsty"

- Bob Marley

"Intelligence is distributed equally around the world but access to opportunity is not"

- Bill Clinton

Plenary Paper Session 1: Water and Sanitation

- **Appropriate Technologies for Water and Sanitation**
John Tharakan, Department of Engineering, Howard University
Washington DC, USA
- **Sustainable Freshwater Supply for Chemical City, Tamil Nadu, India-A Status Update**
Joseph Thomas, Chief Technology Officer
Villgro, Chennai, India.
- **A Sustainable and Robust Water Treatment Unit for Portable Water Production in Remote and Rural Areas**
V.L Pillay¹ and A. Kalu²
¹Dept. of Chemical Engineering, Durban University of Technology, Durban, RSA;
²Centre for Advanced Water Technology & Energy Systems, Savannah State University, Georgia, USA.
- **Safe Water for Health and Wealth**
Stella Odaba
Solar Cookers International (Ea), Nairobi, Kenya
- **Appropriate Technology and Water: Institutions of Higher Learning's Role to find solutions for a Thirsty Planet.**
Tsitsi Gate, Roseline Karambakuwa and Gilbert Chikunwe
Zimbabwe

Question: How long should a bottle of water be in sunlight before it is purified?

Answer: 8 hours plus

Question: How feasible the solar cookers were as a means of water purification

Answer: Most of the materials used in the construction are not expensive making it very economical and affordable.

2nd Keynote speaker: Mr. Kweku Botwe, Managing Director, Ghana Water Company Limited

He spoke about projects the Ghana Water Company was involved in and its efforts to make clean portable water accessible to everyone as well as the challenges it was facing in doing so. He also expressed the hope that the scientific community would be

able to help come up with the appropriate technology to solve some of these problems.

Plenary Paper Session 2: Sanitation and Environment (Session Chair: John Tharakan)

- Barefoot Ethics: Social Justice Through An Appropriate Technology Checklist
Charles C. Verharen and John Tharakan
Departments of Philosophy and Chemical Engineering, Howard University
Washington, DC, USA.
- Placer Mining and the Guyana Environment
Tom Dalgety
Guyana Geology and Mines Commission (GGMC)
Georgetown, Guyana.
- Household Willingness to pay for Improved Solid Waste Management in Osun State, Nigeria.
Adepoju, A.A and K.K Salimonu
Department of Agricultural Economics and Extension, Ladoke Akintola
University of Technology,
Ogbomoso, Nigeria.
- Wastewater Minimisation in the Production of Kenkey (A Traditional Ghana Corn Product)
Nii Darko Asante
Food Process Engineering Department, Faculty of Engineering Sciences
University of Ghana, Legon, Ghana.

Question: Why was the chosen method of processing kenkey chosen based on texture of the resultant product?

Answer: The kenkey makers' willingness to employ the new method would be based on the acceptance level of the buyers which is determined by the feel and taste of the resultant kenkey.

Poster Session:

Water, Sanitation and the Environment, Energy, Engineering, Information and Communication Technology, Food and Shelter, and Health were the various groups the posters were presented under.

The poster presented by the four Ghanaian students, '*Autonomous Surface Vehicle (ASV)*' was under the Engineering, Information and Communication Technology Group.

The poster presentations run from Thursday, the 24th to Friday the 25th of November.

FRIDAY, 26TH NOVEMBER

This workshop was titled "*Using Mobile Studio for Low Engineering Laboratory Experience*" and was held between the hours of 8:00 am- 10:00 am. The facilitators were Dr. M. Chouikha (Howard University), Dr. K. Connor (Rensselaer Polytechnic Institute) and Dr P. Bofah (Howard University). Less than 20 people from different institutions such as University of Ghana (Ghana), University of Lagos (Nigeria), University of the District Columbia (USA), University of Development Studies (Ghana) participated in this workshop.

The aim of this workshop was mainly to introduce the concept of being able to set up an engineering laboratory with the help of software known as mobile studio at an affordable cost. There was a brief power point presentation delivered by Dr. K Connor and Dr. M. Chouikha on the use of the software and shared their experiences on how they had used it with their students. Thereafter, there was a hands-on experience where the participants were made to set up their own mobile studio in groups of 2 with 6 mini- laptops. The requirements for the set-up were; Rensselaer Mobile Studio I/O Board, drivers installed mini-USB to USB connector cable, mobile Studio Desktop program, fully installed and windows XP/Vista.

We experimented with some of the functions such as function generator and the oscilloscope, other functions included the spectrum analyzer, the Digital I/O, Arbitrary waveform etc. Through the help of these functions we were able to generate 2 sinusoidal waves, vary their frequencies, shapes, and create sounds among others. We were informed that the software could be used in any discipline to conduct simple experiments. However, one limitation of the software is that its voltage supply was low. By the end of the session, the facilitators stated that they would make the hardware of the mobile studio available to the various tertiary institutions that were represented at the workshop. In addition, we were told that further information on the software could be found on www.mobilestudioprojects.com.

In a nutshell, the workshop was a success and added more to our knowledge with respect to the setting up a mobile studio at an affordable cost.

Key note speaker: Dr. Albert Wright- *Honorary Fellow* of the British Institution of Public Health Engineers, England and a 2009 recipient of the AMCOW AfricaSan Lifetime Achievement Award for his work in Africa on water supply and sanitation.

In his speech he highlighted some of his experiences as a Sanitation Engineer in Africa, specifically in Ghana. He stressed on some of the errors that he had committed during his working years and advised the present and future generations not to repeat them.

He also made a profound statement; “There is excellence in simplicity.”

The day ended with an evaluation and way forward session led by Dr. Hattie Carwell, the president of the National Technical Association. Some suggestions made were an improvement on the addition and participation of students from host countries, a focus on trying to change the mindset of students on appropriate technology (since they are the future leaders), a co-ordination between students in the sub-region, Africa and others outside of the continent on various projects they are involved in, and many others.

Paper Session 1(Food and Shelter): Session Chair: Victor Dzidzineyo, Howard University

- Potentialities of Contemporary Earth Construction Addressing Urban Housing Crisis in Africa
Mohammed Sharif Zami
School of Architecture, Planning and Housing, University of KwaZulu Natal Durban, South Africa.
- The Role of Advanced Construction Technologies In Promoting Sustainable Shelter, Water and Development in South Africa.
Kuchena Jubulani Charles, Chakwizira James, Usiri Paul*
CSIR- Built Environment, Pretoria, South Africa.
*Palace Technologies, Johannesburg, South Africa.
- Enhancing Crop Production in Zimbabwe Through the Use of Information and Communication.
S.M Nleya, T.V Nyathi and N. Kokera

Department of Computer Science, National University of Science and Technology
Bulawayo, Zimbabwe.

- Business Solutions for Small Irrigation Technologies: MEDIA's Experience in Zambia.
Alexander Snelgrove and Lemmy Mjane
Menonite Economic Development Associates

Paper Session 2 (Engineering, Information and Communication Technology): Session Chair:
John Trimble, Howard University.

- Innovation in Engineering, Information and Communications Technology
Peter Bofah and Mohammed Chouikha
Department of Electrical and Computer Engineering
Howard University, Washington, DC, USA
- Linking ICTs to Community Development: Case of Masendu Community in Bulilima Mangwe District of Zimbabwe
Kudakwashe Madzima
Computer Science Department, University of Swaziland, Kwaluseni, Swaziland.
- Using Business Rules Standards to Advance E-Governance
John Trimble, Harry Kneeling and Mugizi Robert Rwebangira
Systems and Computer Science Department
Howard University, Washington, DC, USA.
- Are COTS-based Systems and Appropriate Technology
Gada Kadoda
Khartoum, Sudan.

Question: Why were women the predominant user group of the internet?

Answer: Generally, there were more women than men in the community. This was most likely due to the migration of the young men to neighbouring countries (as a result of post war hardships) to make money quickly. The women also showed more interest in the ICT lessons than the males.

Paper Session 3 (Energy and Health): Session Chair: Joe Fortunak, Howard University

- Carcoal as an Alternative Energy Source among Urban Households in Ogbomoso Metropolis of Oyo State
Okunade, E.O. (Ph.D)
Department of Agricultural Economics and Extension
Ladoke Akintola University of Technology, Ogbomoso, Nigeria.
- A Bottom-up Approach to Energy Policy Planning in West Africa: The Case of Distributed Generations of Renewable
Ogundiran Soumonni
School of Public Policy, Georgia Institute of Technology, Atlanta, Georgia.
- Design of PV Solar Home System For Use in Urban Zimbabwe
J. Gwamuri*, S. Mhlanga
Applied Physics and Radiography Department, Faculty of Applied Sciences,
National University of Science and Technology, Bulawayo, Zimbabwe.
- Design of a Size Adjustable Surgical Shoe: Achieving Optimal Asepsis Comfortably

Jason Atike and Elsie Effah Kaufmann
Department of Biomedical Engineering, University of Ghana
Legon, Accra, Ghana.

- Care Practices at Home for People Living with AIDS in Accra, Ghana: The Use and Management of Household Resources
Vivian Tackie Ofori
University of Ghana, Legon, Ghana.
- A survey on the Association Between Blood Glucose Levels, Hyperlipidemia and Selected Type 2 Diabetes Predisposing Risk Factors in Bulawayo District, Zimbabwe
Shadreck Dube, Tawanda Msonza, Jeffias Gwamuri, Cinderella Dube
Department of Applied Biology and Biochemistry, National University of Science and Technology, Bulawayo, Zimbabwe.
- Building Capabilities for Regional Production of Quality-Assured Medicines in Africa.
Joseph M. Fortunak, Stephen R. Byrn, Zita Ekeocha
Howard University Departments of Chemistry and Pharmaceutical Sciences, Washington, DC, USA; Department of Industrial and Physical Pharmacy, Purdue, West Lafayette, IN, USA and Kilimanjaro School of Pharmacy-Industrial Pharmacy Teaching Unit, Moshi, Tanzania.

Question: Was the differing weight of users with respect to the pressure they exert on the shoes taken into consideration in the design of the surgical shoes?
Is the shoe being commercially produced now?

Answer: yes, the weights were considered in the design.

No, commercial production of the shoes have not started yet.

THE BANQUET AT ANGE-HILL HOTEL, EAST LEGON-ACCRA, GHANA

The banquet which was moderated by Mr. Philip Gyau-Boakye, began at approximately 7:30 pm with an opening prayer by, Mr. Joseph Ampofo. This was followed by a welcome address by Dr. John Trimble, the 4th ICAT chair. Dinner was served as live band music filled the premise. Afterwards, the Director General of CSIR, Abdulai B. Salifu introduced the speaker, Honorable Hanny-Sherry Ayitey, the Minister of Environment Science and Technology. Unfortunately she was not able to make it to the banquet, so a representative from the ministry read her speech on her behalf.

In her speech, she laid emphasis on the importance of water and how the absence of safe drinking water could lead to the outbreak of water borne diseases. She also commended the organization of this program.

Thereafter, Dr. Hattie Carwell, the president of the National Technical Association continued with a conference summary, where she highlighted the events that had taken place throughout the conference. Lastly, the ICAT chair, Dr. John Trimble, gave his closing remarks and acknowledged those who had helped in the organization of this conference. The banquet then ended at approximately 9:45pm.

TRIP TO CAPECOAST CASTLE

On Saturday, the 27th of November, 2010, there was a trip to the Cape Coast Castle at Cape Coast. This castle is a historical monument since it served as a transit point for slaves

captured from all over the sub region. Thus, the exit of the castle is known as the *Gate of no Return*; slaves that were taken through that door never came back.

BENEFITS OF THE CONFERENCE

On the whole, we became aware of the fact that appropriate technology was simply about seeing a problem in your locality and being concerned enough to try and come up with a solution to it. Thus, it was something that could be done especially by students who form the upcoming generation. We also had the chance to meet and interact with several resource personnel and discuss their area of research with them. It was a very informative and morale boosting conference that spark in us, the need to open our eyes to the problems around us and use our knowledge acquired so far to try and solve them, using the appropriate technology.