

**ESSAY FOR UNESCO-IHE SUMMER PROGRAM**  
**BY**  
**WENDY MUSSOLINE**

One of my major environmental career goals is to help educate people and reduce health risks associated with poor sanitation practices for populations living in the developing world. I graduated with a Master's degree in the Department of Environmental Engineering from the University of Florida (UF) and have been consulting in this field for the last ten years. As part of my graduate studies at UF, I took an elective course entitled "Water and Wastewater Treatment for Developing Nations." The course focused on the application of simple but innovative treatment technologies to reduce the disease burden in rural communities of the developing world. This course ignited my interest in the design and application of small scale systems that could protect public health and improve living conditions of the poor. My field research at UF was conducted at a landfill in Alachua County (Florida) where waste-to-energy concepts were developed and implemented. Accelerated waste decomposition processes were being employed to generate increased methane concentrations for the production of electricity (aka "green power"). My specific project involved combining digested wastewater sludge with landfill leachate as a form of biological treatment to reduce excessive ammonia concentrations in the leachate. My research experience at UF helped me to understand and apply engineering concepts that used microbial energy to reduce the load on the environment.

My engineering foundation provides the necessary skills to design innovative solutions to problems such as contaminated water supply systems and lack of basic sanitation systems. However, I have learned that simply introducing a new technology into a foreign culture will fail without community support and involvement. I believe that a global health perspective is an essential part of overcoming cross-cultural barriers and more clearly assessing the health needs in a particular community. Thus, I am currently enrolled in a Doctoral Program in the Department of Global Health through the College of Public Health at the University of South Florida (USF). My current research objective is to engineer a sustainable solution to a significant global health problem with a special emphasis on renewable energy and resource recovery. The project is motivated in part by the United Nations Millennium Development Goal #7 to ensure environmental sustainability. An estimated 2.5 billion people lack access to basic sanitation services, and approximately 2.4 billion people live without access to modern cooking and heating services (UN, 2008).

My interests in studying at the UNESCO-IHE summer program are multi-faceted. My primary interest is to learn from experts and to gain hands-on experience working with anaerobic reactors. The specific aim of my research is to develop a novel, yet simple anaerobic digester that is capable of treating raw wastewater or wastes and destroying persistent pathogens (i.e. *Ascaris*) while facilitating methane production that can be directly used for cooking/heating purposes and yielding nutrients for growing crops. Dr. Piet Lens has been trained in Environmental Sanitation and he has published several papers on advanced biological treatment processes, methane production from waste, resource recovery, and sustainable development of anaerobic processes. As I participate in on-going research with Dr. Peit Lens, I hope to gain knowledge and experience that will carry over into my research objectives described above.

Secondly, I am interested in the diversity of cultures represented by the IHE program. This cross-cultural exchange will help to prepare me for my field work in rural Latin America. We, as Americans, struggle with ethnocentrism and tend to get caught up in our own ways of doing things. I think the exposure to the international students over the course of 10 weeks will help me learn to respect others' perspectives and learn from those that may look different from me. As a high school student, I had the opportunity to spend two summers in Europe, immersed in the German culture. Even at that age, I recognized how conservative Germans were with their limited resources. Their preservation mentality was a stark contrast to our throw-away society in the US. I believe that my cross-cultural experience at IHE will help me to be more culturally sensitive during my field study in rural Latin America.

Finally, I'm excited to spend several weeks away from my own surroundings to gain fresh perspectives and to rejuvenate my passion for research. The global partnership between UNESCO and IHE is based on sustainable management of water and environmental resources in order to improve the quality of human life and the environment in developing countries and countries in transition. My research objectives align with this vision and I am looking forward to a wonderful learning experience. Since my lab studies have not started, I have the opportunity to adjust my methods/procedures/objectives before solidifying my research proposal. Thus, the input I receive from UNESCO-IHE will be extremely valuable to my future as a doctoral student. In addition, they have a solid network of people that have attended the University over the years and networking opportunities are endless. I also believe that funding agencies will look highly on this summer training experience and see me as a viable candidate for other grant applications.

## References

**United Nations.** 2008. End Poverty 2015 Millennium Development Goals - Goal 7: Ensure Environmental Sustainability Fact Sheet, New York.