

## **GLOBAL WATER AND SANITATION: OPPORTUNITIES FOR STUDENT INVOLVEMENT DURING ACADEMIC YEAR 2012-2013**

Access to safe drinking water and basic sanitation services is one of the greatest challenges in the developing world. Every 20 seconds someone in the world, usually a child, dies from a water-related problem. University of Pennsylvania [UPenn] students will have opportunities to be involved in addressing these issues during academic year 2012-2013. These opportunities include [1] research which can be done, with your advisor's permission, in fulfillment of requirements for Capstone reports, senior thesis, and/or independent studies, [2] assisting NGOs such as the Philadelphia Global Water Initiative [ [www.pgwi.org](http://www.pgwi.org) ] and other local organizations, [3] assisting with water conferences to be held at UPenn in 2012-2013, and/or [4] possible field trips to international conferences, the United Nations, and the USA government in DC. Courses related to these issues will also be offered through the MES program.

This report provides information on these opportunities as follows:

- ❖ Section A --Research [Page 2-4]
- ❖ Section B-- PGWI and other UPenn NGOs [Page 5-6]
- ❖ Section C-- UPenn Conferences [Page 6]
- ❖ Section D-- Possible Field Trips [Page 7]
- ❖ Appendix A: Special Research Competition [Water For People] [ Page 8-9]
- ❖ Appendix B: Additional Research Topics [Page 10-12]

Stan Laskowski, MES Instructor/Advisor, will provide overall coordination of these efforts. He can be contacted at [laskowski6@aol.com](mailto:laskowski6@aol.com). Stan is a former USEPA Senior Executive and is currently President of the Philadelphia Global Water Initiative, which he co-founded in 2006.

## SECTION A-- RESEARCH

The following are research opportunities for University of Pennsylvania [UPenn] students to consider during the 2012-2013 academic year. The research can be done for academic credit with approval by the student's advisor and will be supervised by Master of Environmental Studies [MES] Lecturer/Advisor Stan Laskowski or other experts specified below. If you have any questions or need more information please contact Mr. Laskowski at [laskowski6@aol.com](mailto:laskowski6@aol.com).

[1] **OPPORTUNITY TO RESEARCH ISSUES FOR A LEADING NGO:** Water For People, one of the leading organizations working on water/sanitation issues in developing countries [[www.waterforpeople.org](http://www.waterforpeople.org)], and UPenn will sponsor a student or group of students to address a key issue relating to the financing of water/sanitation projects. Students will be given an opportunity to submit a proposal and a panel will select a team to do this research. The Initiative for Global Environmental Leadership/ Wharton has agreed to provide \$3000. to the student for this research. Please see Appendix B for instructions. **Please note the deadline of September 30, 2012 for submittals.**

[2] **OPPORTUNITY TO WORK WITH GLOBAL WATER STRATEGIES AND GE-WATER LEADERS:** Francesca McCann [Global Water Strategies] and Jon Freedman [General Electric --Water] have identified the following research needs for graduate students. Ms. McCann and Mr. Freedman will guide the student research.

**A. Project:** Viability of water rights trading in the U.S.

**Deliverable:** Overview and analysis addressing key challenges and opportunities in the U.S. water rights market.

**Research to include:**

- Assessment of existing and potential players in the market including investors, companies, users, water rights owners, other.
- Identification of key drivers – drought, industrial use, agriculture and irrigation, frac'ing, etc.
- Review of publicly available data on water rights deals/trades
- Review of existing and developing legislation and regulation
- Identification of key regulatory hurdles/barriers
- Identification of potential areas/regions for trading
- Identification of existing data sets and data needs

**B. Project:** Brazil - water reuse market

**Deliverable:** White paper examining water reuse in Brazil and suggestions for viable water reuse policies.

**Research to include:**

- Identification of key economic barriers to increased water reuse in Brazil
- Outline of the current state of water reuse in Brazil
- Identification of how much water is being reused and in which areas
- Examination of current reuse policies, laws and regulations
- Identification of what could be done from a policy standpoint to promote greater reuse and to remove barriers
- Suggestions of new reuse mandates and incentives
- Examination of best in class policies and application to the Brazilian market
- Overview of water pricing

\* Research will largely be primary research, including interviewing government officials and representatives of utilities and industrial companies. We will provide guidance on documents and examples of water reuse and other policies around the world.

**C. Project:** Saudi Arabia - water reuse market

**Deliverable:** White paper examining water reuse in Saudi Arabia and suggestions for viable water reuse policies

Saudi Arabia has announced the goal of increasing water reuse from 11% to 60% by 2016, but because water so inexpensive, the government faces challenge in getting people and industry to invest in using water more efficiently.

**Research to include:**

- Identification of key economic barriers to increased water reuse in Saudi Arabia
- Outline of the current state of water reuse in Saudi Arabia
- Identification of how much water is being reused and in which areas
- Examination of current reuse policies, laws and regulations
- Identification of what could be done from a policy standpoint to promote greater reuse and to remove barriers
- Suggestions of new reuse mandates and incentives
- Examination of best in class policies and application to the Saudi market
- Overview of water pricing

\* Research will largely be primary research, including interviewing government officials and representatives of utilities and industrial companies. We will provide guidance on documents and examples of water reuse and other policies around the world.

**D. Project:** Trends in public water infrastructure funding in the U.S.

**Deliverable:** White paper examining the trends of federal and state water infrastructure funding by year since 1900.

**Research to include:**

- Identification of federal public funding of water by:
  - Agency (at a minimum include Corps of Engineers, Bureau of Reclamation, US Geological Survey, Tennessee Valley Authority, Office of Saline Water, etc.); and
  - Activity (at a minimum include planning, data collection and research, infrastructure, etc.)
- Summary of funding trends and evidence of possible causes
- Overview of state funding for water through federal matching programs
- Forecast of future prospects for public water funding

**[3] CONTINUING RESEARCH ON WITH STAN LASKOWSKI/ DR. FRED SCATENA:**

- ❖ Performance Indicators: measuring the success of water/sanitation projects is critical to the long-term sustainability of projects in developing countries. This research can build on a 2012 research report on this subject by UPenn professors and students [ [http://pgwi.org/wp-content/uploads/2011/10/PGWI\\_performance\\_indicator\\_report\\_Final.pdf](http://pgwi.org/wp-content/uploads/2011/10/PGWI_performance_indicator_report_Final.pdf) ].
- ❖ Other water/sanitation research issues: see Appendix B

**[4] GENDER AND WATER:** in preparation for the Spring 2013 PGWI Conference on this theme, research can be done on issues related to women and water/sanitation [possible presentation at the Conference] and possible publication through the wh2o journal [ <http://wh2ojournal.com/> ].

## **SECTION B-- PHILADELPHIA GLOBAL WATER INITIATIVE [PGWI] AND OTHER UPENN NGOS**

There are many opportunities for "hands-on" work with water/sanitation NGOs on UPenn's campus and in the Philadelphia area. The following are some of those opportunities:

[1] **PGWI** [ [www.pgwi.org](http://www.pgwi.org) ] was founded in 2006 by the members of UPENN and other leaders throughout the Philadelphia Region to [a] help those in developing countries gain access to clean drinking water and improved sanitation services, and [b] to educate those in the Philadelphia Region about the global water crisis. Members of the PGWI network have been active in a number of countries and much more work needs to be done. See <http://pgwi.org/collaborators/> for a list of NGOs and other organizations in the PGWI network. The following are some PGWI needs:

- ❖ Assist PGWI committees [eg, marketing/communications; development]
- ❖ Maintain and improve PGWI's website and social media sites.
- ❖ Assist NGOs in the PGWI network in implementing a water or sanitation project in a developing country.
- ❖ Develop a strategy to make Philadelphia a Center of Excellence for global water/sanitation[ including bringing people from the developing countries to Philadelphia/Penn for academic and hands-on training]
- ❖ Research what conditions should exist in the developing country before PGWI commits to involvement in that country

Contact Rupal Prasad, PGWI Program Manager, at [rupalp@sas.upenn.edu](mailto:rupalp@sas.upenn.edu) for information regarding how you can become involved.

[2] **A SPRING OF HOPE [ASOH]** a non-profit organization founded by UPenn senior Brittany Young. ASOH [ <http://www.aspringofhope.org/> ] provides water, sanitation, and other services to schools in South Africa and other countries. Contact Brittany at [bryoung@sas.upenn.edu](mailto:bryoung@sas.upenn.edu) for information on how you can help.

[3] **ENGINEERS WITHOUT BORDERS [EWB]** has a chapter at UPenn. In addition to other activities they implement water and sanitation projects in developing countries. See their website at <http://pennewb.org/> or contact them at [pennewb@gmail.com](mailto:pennewb@gmail.com) .

**[4] WH20 THE JOURNAL FOR GENDER AND WATER** [ <http://wh2ojournal.com/> ] was founded by two Upenn students, Caroline D'Angelo and Dakota Dobyns, and launched in April 2012. It is dedicated to advancing academic research on issues related to women and water. Contact Caroline [ [ccdangelo@gmail.com](mailto:ccdangelo@gmail.com) ] or Dakota [ [dobynsd@wharton.upenn.edu](mailto:dobynsd@wharton.upenn.edu) ] for more information on how you can become involved.

## **SECTION C-- UPENN CONFERENCES**

During Academic Year 2012-13 UPENN and its collaborators will be holding several water-related events on campus. The following are examples of where student help will be needed in either organizing the event or conducting background research on the issues to be addressed at the event.

### **[1] SIXTH ANNUAL PGWI CONFERENCE:**

This Conference, sponsored in partnership with the Initiative for Global Environmental Leadership/Wharton [IGEL] and WH20 The Journal for Gender and Water, will be held on April 9, 2013 at the Wharton School in Huntsman Hall. The theme of the Conference will be the "Gender and Water: Beyond the Burden". Speakers will be from academia, government, and private sector. If you would like to assist with this Conference contact Iliana Sepulveda at [iliana.sepulveda@gmail.com](mailto:iliana.sepulveda@gmail.com) or Rupal Prasad at [rupalp@sas.upenn.edu](mailto:rupalp@sas.upenn.edu) .

### **[2] INITIATIVE FOR GLOBAL ENVIRONMENTAL LEADERSHIP AT WHARTON/WHARTON [IGEL]:**

This Conference, one of a series of annual Conferences sponsored by IGEL, will be held on March 21, 2013 in Wharton's Huntsman Hall. The theme is water-energy-food nexus. For information regarding how you can be involved contact Dakota Dobyns at [dobynsd@wharton.upenn.edu](mailto:dobynsd@wharton.upenn.edu).

## **SECTION D-- POSSIBLE FIELD TRIPS**

### **[1] 2013 WORLD WATER WEEK IN STOCKHOLM SWEDEN**

On September 1-6, 2013 Stan Laskowski will be attending this annual conference with students from UPenn and members of the Philadelphia Global Water Initiative. Students can elect to attend the conference as part of a course for academic credit, with permission from their advisor. There may be opportunities to present papers and/or posters. See <http://www.worldwaterweek.org/> for more details. Contact Stan Laskowski [[laskowski6@aol.com](mailto:laskowski6@aol.com) ] or Rupal Prasad [ [rupalp@sas.upenn.edu](mailto:rupalp@sas.upenn.edu) ] for details.

### **[2] OTHER POSSIBLE FIELD TRIPS**

Other trips throughout the academic year are being considered. The possibilities include trips to the United Nations, US Government in DC, local treatment plants, and opportunities to visit developing countries. Details to follow.

## **APPENDIX A: OPPORTUNITIES FOR GRADUATE STUDENT RESEARCH FOR WATER/SANITATION IN THE DEVELOPING WORLD--REQUEST FOR STUDENT PROPOSALS**

Water For People, a leading NGO, works with partners to develop innovative and long-lasting solutions to the water, sanitation, and hygiene problems in the developing world [see [www.waterforpeople.org](http://www.waterforpeople.org)]. The University of Pennsylvania [UPenn], Water For People, and the Philadelphia Global Water Initiative [PGWI] have signed a Memorandum of Agreement to work together on these issues, including using student research to better understand and support Water For People's mission overseas as appropriate. The following opportunity will provide students a chance to work with leaders on the cutting-edge in the developing world as they find solutions that will improve health and save lives.

**REQUEST FOR STUDENT PROPOSALS:** The Initiative For Global Environmental Leadership [IGEL]/ Wharton will provide up to \$3000 to a graduate student, or team of students, for one of the projects outlined below. By September 30, 2012 interested students will submit a 2-3 page proposal that will outline the research that they would undertake, their credentials [i.e., resume and how they meet the criteria outlined below], a timeline for the research [research should start in November, 2012; project deliverables should be complete by April 2013], and the budget needed for the project.

By mid- to late October a team from UPenn, Water For People, and PGWI will review the proposals and select the one to be funded. It must be noted that students will not receive any funding for their research from Water For People. Instead, Water For People staff can be interviewed, staff can show students field sites that would help them with their research and can offer other forms of in-kind support.

With advisor approval, this research can be done for academic credit [ eg, Capstone, Independent Study, course requirement]. The work will be supervised by Water For People and Stan Laskowski, MES lecturer/advisor [or other UPenn professor]. Please direct any questions to Stan Laskowski [ [laskowski6@aol.com](mailto:laskowski6@aol.com) ]. **Proposals should also be submitted to Stan by September 30, 2012.**

**PROJECT 1: Financial Models For Water/Sanitation projects:** Finding creative financial solutions for long-term sustainability of water/sanitation projects in the developing world.

**BACKGROUND:** Water For People is interested in developing financial models that work in developing countries to ensure that water/sanitation projects have long-term sustainability. All water supply and sanitation facilities will need to be replaced over time. Water For People's goal is to create effective financial models that create a situation where



Water For People (or any other international NGO) will be responsible for the finances needed to replace water systems and sanitation facilities. This ambition is rare in the water and sanitation sector.

It is becoming clear to Water For People that a sole reliance on tariffs for full replacement will not lead to local-level, non-international NGO supported replacement. Places like Latin America, where population densities are small and system costs are high, will never be able to replace their systems through tariffs alone.

As such, alternative financial models are needed to augment local tariff collection to build reserves and financial resources sufficient to meet on-going operations and maintenance support (O&M), repairs and eventual replacement costs.

Water For People staff has some initial ideas on how to address this considerable challenge that will need to be tested and understood more thoughtfully.

The assignment is to come up with a research project that explores what Water For People is considering and offers concrete ideas on how these ideas can be supported and implemented, as well as augmented with other financial mechanisms not being considered by Water For People to make a more cohesive and successful financial package for poor communities worldwide. The student work will first look broadly at the challenges and possible solutions and then determine if these solutions will work "on site". Discussions with the local banking communities and insurance companies may be involved. A successful research project will provide several good examples of what will work in local situations [not ideas that may not proved to be successful]. The ideal student should meet some of the following criteria [1] A demonstrated track record of finding workable solutions to complex problems, [2] Knowledge of water/sanitation issues in the developing world, [3] An understanding of a broad range of financial approaches and packages that can be brought to bear on water and sanitation solutions in developing countries, and [4] Demonstrated research and writing skills.

**PROJECT 2: Assisting Entrepreneurs in Developing Countries:** Providing mentoring and/or research support to innovators, particularly those operating in Africa and India.

**BACKGROUND:** Water and sanitation entrepreneurs operating in developing countries could use insights and assistance from students who are themselves experienced entrepreneurs. Water For People attempts to encourage creative solutions and a more formal process in supporting these entrepreneurs. The ideal student would have experience as an entrepreneur, and demonstrated research and writing skills. A successful project will provide assistance to an entrepreneur in a developing country who is currently operating in the informal economy, or is in a related formal economy context but is trying to grow her/his water or sanitation business in creative and effective ways that translates to increased coverage and better services for the poor.

## **APPENDIX B: OTHER WATER/SANITATION RESEARCH TOPICS**

### **[5] ADDITIONAL RESEARCH WITH STAN LASKOWSKI AND/OR LEADING WATER PROFESSIONALS:**

- ❖ **OVERALL GOAL-SETTING:** The MDGs for drinking water/sanitation have been established with a target year of 2015. What goals should be set for beyond 2015? Develop specific future goals, the appropriate year for these goals, and recommend metrics for the world community to use in measuring success.
- ❖ **GOVERNANCE:**
  - A. Some developing countries are making much better progress toward meeting the MDGs for water/sanitation than other countries. What do these more successful countries have in common? Can these common elements be modeled so that success can be predicted? What are the critical elements that a country must have to be successful? What metrics should be used to measure success?
  - B. At the local level what are the essential elements that local officials need to ensure success of a water/sanitation project? What do/should donor organizations and local managers require to help ensure success?
  - C. What indicators should the world be using to measure water/sanitation success in developing countries? What is the quality of the data now being collected by UNICEF/WHO to measure overall success? How can it be improved?
  - D. Which anti-corruption approaches are most effective in developing countries? Why? How can these approaches be transferred to other developing countries?
  - E. What lessons can developing countries learn from the US experience in providing water/sanitation services?
  - F. How can governments in developing countries be convinced to increase priority funding for water/sanitation projects? What barriers exist and how can they be overcome? What metrics should be used to measure success?
  - G. Provide an assessment of the relationship between MDG #7 Target #10 and another MDG.
  - H. Evaluate the approaches used by Water Safety Plans and Integrated Water Resources Management Plans and show where each is most appropriate to use.

- I. Document the potential impacts of climate change in a specific region and address its implications
- J. What are the implications of having access to water as a basic human right? What actions need to be taken in order to make this a reality?
- K. Propose additional steps that the US Government should take to help with the global water/sanitation problem [explain why additional support to this effort is in the best interest of the US]
- L. Show how multiple use systems [eg, drinking water and crop irrigation] can be community managed , allocating water , especially during periods of drought. [Dick R]
- M. Document the necessity of children having clean drinking water and sanitation services both at home and in schools. [Dick R]

❖ FINANCE/ECONOMICS:

- A. Which financing methods for water/sanitation work best at the local level? The national level? Why? What pre-existing conditions are needed for a particular funding approach to be successful?
- B. Develop a primer for people in developing countries to use in making financing decisions to pay for water/sanitation.
- C. Which type of financial aid has been most effective in promoting water/sanitation projects in developing countries?
- D. Evaluate the effectiveness of programs administered by the World Bank or another lending organization.
- E. Show how micro-financing can be used most effectively in local water/sanitation situations.
- F. Propose pricing mechanisms that both make a water/sanitation system sustainable but that also provide adequate water for those in low income situations.
- G. Show the importance of users paying something for water/sanitation services. [Dick R]

❖ TECHNOLOGY

- A. Identify the greatest needs for technological breakthroughs in water/sanitation and set a research agenda for technology improvements.
- B. Examine the current situation for a specific technology [eg, rainwater collection, desalination, water conservation for agriculture] and assess the possibility of future advances
- C. At the household level which techniques for providing clean water work best? If these techniques vary by situation, define the criteria that should be used in deciding which technique to use.

❖ GENDER

- A. What changes should be made to WHO/UNICEF data collection and analysis to reflect the needs of women? What gender-specific data should be collected?
- B. What governmental policy changes in water/sanitation would result in the greatest benefits to women? Why? How can these changes be implemented?
- C. Quantify the impacts of inadequate water/sanitation services on women.
- D. Show the importance of having a significant number of women on local water committees. [Dick R]

❖ PUBLIC HEALTH

- A. Which interventions [eg, hygiene education, oral rehydration therapy, investments in household systems] are most effective in combating diarrhea caused by water/sanitation inadequacies?
- B. Research a specific water-borne disease [eg, diarrhea, trachoma] and summarize the causes of the problem, statistics on the location of the problem, what has been done to address it, barriers to further progress, and your recommendations for improved approaches

