Careers in Humanitarian Engineering

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Agenda

- Get Informed
- The Skills You Need
- Ways to Work in Development
- Activity: Your Personal Roadmap
The Development Industry

The 8 Millennium Development Goals

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Global partnership for development
My Path

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Civil Engineering

- Hurricane Katrina Temporary Housing
- 2016 Chicago Olympic Bid
- WWTP Greenhouse Gas Emissions (Sydney)
- Practice Lead: Conveyance Technologies, International Region

Coordination of business development and technology groups
My Path

President, 2006-2008

- Built to 100 members
- Projects on 3 continents
- Mentors for 6 student chapters
- Fundraising
- Industry Outreach
My Path

Social Sustainability of Sanitation Infrastructure in Developing Communities

Next Step...
My Research

1.2 billion households
My Research

50% rural

1.25 billion

2.25 billion
My Research

1.25 billion

2.25 billion

to do
My Research

40-50% failure rates

1.4 billion
My Research

Facets of Sustainability
- Technical
- Environmental
- Economic
- Social

1.4 billion

40-50% failure rates
My Research

Facets of Sustainability
• Technical
• Environmental
• Economic
• Social

1.4 billion

40-50% failure rates
A Broken Latrine

Photo by Eileen Lambert, courtesy of Water for People
Decoupling & Ceremonial Adoption
(Meyer and Rowan 1977)

“Certainly there is a problem with it [open defecation]…otherwise the government would not tell us to build toilets.”
Change in Structure

- <Redacted> is dedicated to the goal of building a culturally diverse and pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities, individuals with disabilities and covered veterans.

My Research

Percentage of tenured or tenure track engineering faculty (Engineering by the Numbers, ASEE 2011)

- Male: 86%
- Female: 14%
Change in Structure

- “Open defecation is not good. It is better to have a toilet.”
- “If I practice open defecation there will be diseases.”
- “Everyone in this community had a tree toilet. I myself broke some of them with the local government people. I provoked others to burn tree toilets. We did it to keep our environment clean.”

Without Change in Practice

Percentage of Sustainable Sanitation Systems

- Sustainable: 58%
- Unsustainable: 42%
1. How can we break down (and prevent) decoupling?
   • Improve efficiencies
   • Change rational myths & designs

2. Is decoupling happening in other types of infrastructure systems (e.g. water)?

3. Is decoupling happening in other contexts (e.g. CO renewable energy)?
YOUR Career in Humanitarian Engineering
Get Informed About Development

- Relief Web [http://reliefweb.int/](http://reliefweb.int/)
- UN [www.unwire.org](http://www.unwire.org)
- [https://www.devex.com](https://www.devex.com)

- Hans Rosling’s GapMinder.org
- Video: A History of the World in Four Minutes
Get Informed About the Jobs

- **Myth:** There are no jobs in development

- **Fact:** Devex job search Oct 23, 2013
  - 1992 job postings
  - 128 entry level job listings

- **Tip:** Engineering jobs are often posted as ‘logistics’

- **Aid vs. Development**
Get Informed About the Jobs

- Compared to traditional engineering, an aid/development worker
  - Is paid less
  - Has less job security
  - Has a less comfortable work environment
  - May involve just as much office work
  - Is more hazardous (especially aid)
  - Spends a lot more time away from home
Language: Build Your Skills

- Two United Nations languages (Arabic, Mandarin Chinese, English, French, Russian, Spanish)

- Tools
  - Rosetta Stone
  - Pimsleur
  - University or language school courses, private lessons
  - Skype lessons from around the world
  - Apps: Duolingo, Flashcard Deluxe, Babbel
  - Websites: Livemocha, busuu
Try It Out: Build Your Skills

- Peace Corps or Masters Peace Corps
  - The classic entry point
  - Airfare, insurance, some language training, (small) stipend, preferential hiring
  - US citizens only, college degree almost required
  - 2 years overseas service
  - Couples welcome, children not permitted
  - 6 months - 1 year application
  - Highly competitive
  - Preference for location and job not guaranteed
Try It Out: Build Your Skills

- World Water Corps (Water for People)
  - 1 week – several months
  - Self-funded
  - Community interviews, GPS mapping
  - A great start, but not enough
Try It Out: Build Your Skills

- Engineers Without Borders
  - 1 week – several months
  - Self-funded
  - Potential for design, construction, and management work
  - A great start, but not enough
Try It Out: Build Your Skills

- **Fulbright**
  - Support for international study, research, or teaching English
  - HIGHLY competitive: formal competitions within your university before the official Fulbright competition
  - Preference for those with little or no international experience
  - Different Fulbright awards have different citizenship requirements
Try It Out: Build Your Skills

- Rotary Ambassador Scholars
  - $25,000 for international study or research
  - Citizenship requirements
Try It Out: Build Your Skills

- Boren Fellowship
  - $30,000 for international study or research, 12 weeks - 24 months
  - Cultural immersion and language study
  - Citizenship requirements
  - Must be current graduate student at US university
  - National security focus; 1 year service requirement with federal government (various agencies)
Try It Out: Build Your Skills

- Kiva Fellows
  - 21+
  - No citizenship requirement
  - 16 weeks +
  - Self-funded
  - Microfinance, not engineering
Try It Out: Build Your Skills

- Just go & make yourself useful
  - Self-funded
  - Can be hard to find engineering volunteer work
Grad School: Build Your Skills

- University of Colorado, Boulder Engineering for Developing Communities
- Michigan Tech D80 Center
- University of North Carolina Water Institute (Public Health)
- University of Oklahoma WaTER Center
- Stanford (Jennifer Davis)
- University of Washington, Seattle (Jessica Kaminsky)
- Loughborough University (UK)
- Cambridge Development Studies (UK)
Grad School: Build Your Skills

- EPA STAR, NSF GRFP (Graduate Fellowships)
  - About $30,000/year for tuition + stipend + research expenses
  - Limited extra money available for international data collection (NSF)
  - Eligible as a senior and during first 1.5 years of grad school
  - Need to find a professor to support your research
Ways to Work in Development
Ways to Work in Development
Start Your Own NGO

• Entrepreneurial skills required
• Funding required

Jeff Walters, Second Mile Water
Ways to Work in Development
Small Development Organization (often NGO)

- Funding & job security usually an issue
- Ability to take on a lot of responsibility quickly
- Probably lower salary
- More ability to impact direction of work
- More grassroots work
Ways to Work in Development
Big Development Organization (government or multilateral)

  - Look for internships or Young Professionals Programs
  - Some programs specific to citizenship

- US Foreign Service
  - A great deal of work is currently in the Middle East
  - Some posts do not allow family to accompany

- US Agency for International Development (USAID)
  - AAAS Fellowship (masters degree or PhD required)
  - Peace Corps
Ways to Work in Development
Development Focused Consultant

- USAID Private Sector Partners
  - Chemionics (*Obligated USAID funding:* $832.8 million, 2011)
  - DAI (*Obligated USAID funding:* $614.6 million, 2011)
  - Louis Berger Group (*Obligated USAID funding:* $533.1 million, 2011)
  - Etc.
Ways to Work in Development
Traditional Consultant with Volunteer Time
Or, Change from Within

- Traditional engineering work, benefits & pay
- Limited time for development—typically volunteer
- Most people on this path spend a couple weeks a year overseas
- A very few spend significantly more
Ways to Work in Development
Academia

- Research & teaching
- Limited location flexibility
- PhD required
- Thinking about development rather than doing it
Ways to Work in Development

Be a Philanthropist

- Get the highest paying job you can
- Send your salary to aid organizations

THE LIFE YOU CAN SAVE

Join the 16,532 people who have taken the pledge!

I PLEDGE that over the coming year I will give % of my income to an organization, or organizations, helping people living in extreme poverty.

First Name
Last Name
Email

Take the Pledge!

Not ready to Pledge? Subscribe to our Newsletter and stay in touch!
Get A Job

- http://reliefweb.int/
- http://www.trust.org/jobs-market/
- www.devex.com (entry level jobs section)
What you need

University Degree
  • Proof of software skills
  At least two United Nations languages (Arabic, Mandarin Chinese, English, French, Russian, Spanish)
  Relevant overseas work experience (1 year +)

Humanitarian Engineering Career!!!

1. Where do you want to go?
2. Your current status
3. What’s the schedule?
4. What’s the cost?
5. How can you make it happen?

Your Personal Roadmap
Humanitarian Engineering Career!!!
Your Personal Roadmap

1. Where do you want to go?
   - Start your own NGO
   - Small development organization
   - Big development organization
   - Consultant to a development organization
   - Traditional engineering + volunteer
   - Academia (apply to UW!)
   - Philanthropy

2. What do you need to get there?
   - Language
   - Overseas experience
   - Degree
   - Graduate degree? Work experience?
   - Your current status
   - What’s the schedule?
   - What’s the cost?
   - How can you make it happen?

When you make it, let me know.

Thank you!
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