

## Engineers Without Borders: Challenges in Rwanda



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## A Brief History of EWB-UW

- Engineers Without Borders came to Madison in 2003 because of professor of Civil Engineering Peter Bosscher, founder and first academic advisor.
- His memory continues to inspire all people to include service in their lives and careers.
- Currently, 4 international projects, 1 domestic project, and ~75 active members
- Academic advisors: Giri Venkataramanan and Norm Doll
- Past funding by Associated Students of Madison, EWB-USA grants, Rotary International grants, private donations.



## Where is Rwanda?



## Rwanda

- About the size of Maryland, but with 10 million people
- Very poor and rural, 90% of people in subsistence agriculture
- Languages: Kinyarwanda and French
- Continuing problems: water availability and sanitation, overpopulation, land availability, and malnutrition



## Rwanda: The Genocide

- Ethnic violence since 1950's
- Genocide began in 1994; approximately 1,000,000 dead
- Continued effects through society
  - Lack of trust
  - Loss of professionals
  - Destroyed infrastructure



## The Landscape

- Largely volcanic
- Nicknamed "Land of 1000 Hills" (steep slopes)
- Two wet and two dry seasons
- People farm wherever they can due to overpopulation
- Causes significant soil erosion



## Muramba, Rwanda Project Background

- Started in 2003.
- Assessment trips in 2004: lack of potable water
- Implementation trips:
  - July 2005: laying 7 km of pipeline
  - July 2007: adding a rainwater collection system
- Other projects:
  - Water collection and sanitation
  - Solar energy
  - Cooking



## Winter 2009 Assessment Trip

- Goals: to examine agricultural practices, indoor air quality, and stove design
- Team of six EWB members:
  - Two professionals: Danielle McIntosh and Carl Houtman
  - One graduate student: Tim Miller
  - Three undergraduate students: Matt Carlson, Julia Wagner, Davie Chen
- Stayed with Catholic sisters at a convent in Muramba



## The Assessment

- Home survey: 11 households across three income levels
  - Agricultural
  - Health
  - Cooking
- Soil testing: 34 sites
  - Used modified tests from USDA Soil Quality Test Kit Guide
- Air quality: 4 households tested
  - Particulate
  - Carbon monoxide



## Home Survey Results

- Priorities and concerns

Income Level	Number of Households	Top Priorities	Most Common Concerns
LOW	5	1. Food 2. Health	Deer
MIDDLE	3	1. Food 2. Income 3. Education	Deer/Animals
HIGH	3	1. Income/Job 2. Education	Animals

- Farming and livestock practices
- Health, educational, and socio-economical information

## Agricultural Results

- All labor is done by hand
- Crops grown: banana, sweet potato, cassava, beans, cabbage and greens, maize
- Conservation practices:
  - Composting
  - Vegetative buffers
  - Mulching
  - Terracing (government encouraged, but it is costly)
  - Usage is scattered



## Soil Testing Results

- Soil pH: generally too acidic

Income Level	Average pH	pH Range
LOW	6.68	5.19 – 8.11
MIDDLE	5.58	5.55 – 7.98
HIGH	5.43	4.99 – 5.95

- Nitrate
  - Fertile soils: 30 ppm
  - Soils tested: 0-10 ppm

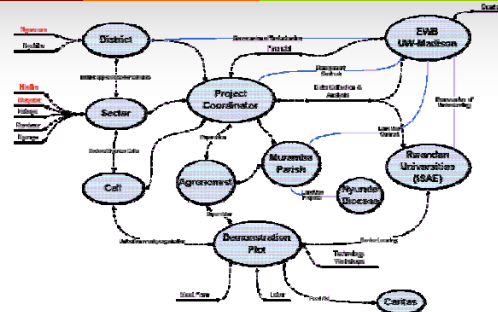


## Assessment Conclusions

- Major needs:
  - Agricultural education
  - Water security
  - Energy
- Action plan
  - Agricultural demonstration plot
  - Continued improvements on rainwater catchment



## Agricultural Implementation



## Project Timeline

- Phase One: 2009
  - Traditional cultivation of land
  - Baseline information collection
- Phase Two: 2010
  - ISAE develops test plot layout
  - Ideal techniques, crop varieties and fertilizer applications
- Phase Three: 2011
  - Additional crop varieties (high value crops)
  - Further assessment of soil quality and productivity



## The Need for a Madison Professional Chapter

- What happens to committed students once they graduate?
- What happens when professionals want to use knowledge and experience to give back?
- Opportunities for a Professional Chapter
  - Technical and project management assistance
  - Mentoring
  - Financial assistance
  - Bringing awareness to the wider community

## EWB – Madison Area Professionals Chapter

- Mission is to assist the EWB-UW student chapter
  - Technical advisors and mentors
  - Fundraising (Looking for spring banquet sponsors)
  - Project management and Safety Issues
  - Organizational Management: Communication among project groups, succession planning, marketing
- All are welcome – you don't have to be an engineer
  - Public health
  - Language translation
  - Agriculture
  - Small business enterprise

## When is EWB – MAP meeting?

- February 11, 2009, 7:00 pm – 9:00 pm, Engineering Centers Building (second Wednesday of the month)

## Contact

- For more information, involvement, or donations
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