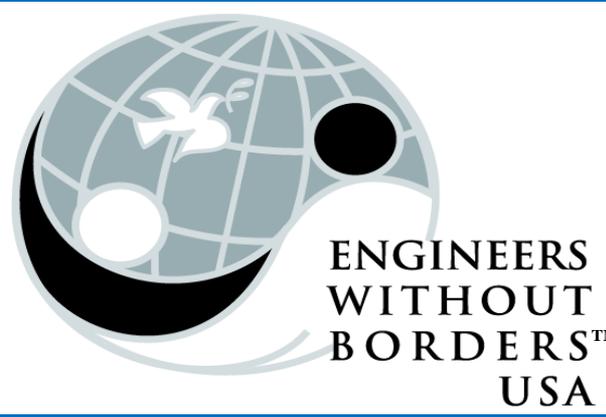


Role of Engineers in Poverty Reduction Challenges and Opportunities

Bernard Amadei

Department of Civil, Environmental, and Architectural Engineering, University of
Colorado, Boulder





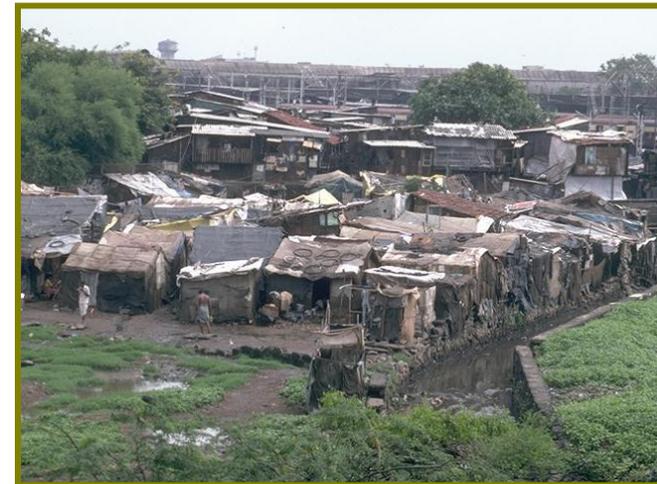
San Pablo, Belize



- 1.2 billion lack clean water
- 2.4 billion lack adequate sanitation
- 2.4 billion are at risk with malaria
- 29,000 children die from hunger daily
- 1.1 billion overfed vs. 1.1 billion underfed

Why Engineering for the Developing World?

- 1.2 billion lack adequate housing
- 1.6 billion have no access to electricity
- 4.2 billion are unable to read
- 1.8 billion live in conflict zones, in transition, or in situations of permanent instability





IN THE NEXT TWO DECADES, ALMOST **2 BILLION** ADDITIONAL PEOPLE WILL POPULATE THE EARTH. THIS GROWTH WILL CREATE DEMANDS ON AN UNPRECEDENTED SCALE FOR:

ENERGY PRODUCTION	FOOD SUPPLY	WATER PRESERVATION	WASTE DISPOSAL
ENVIRONMENTAL CLEANUP	SUITABLE LIVING CONDITIONS	HEALTH CARE	INFRASTRUCTURE
MATERIALS HANDLING	LAND STABILIZATION	EARTH MOVING	TRANSPORTATION DEMAND

Developing a New Generation of Engineers for the 21st Century

Facilitators of...

- Sustainable Development
- Social and Economic Change
- Capacity Building
- Appropriate Technology

Engineers as social entrepreneurs, community builders, peace makers, etc.

Engineering for the other 90%..



Appropriate & Sustainable Technology

“Find out what people do and help them do it better.” E.F. Schumacher



Adapted from ITDG



Fuel Briquettes, Kabul

2008 3 25



2008 3 25



2008 3 25

Engineers Without Borders - USA

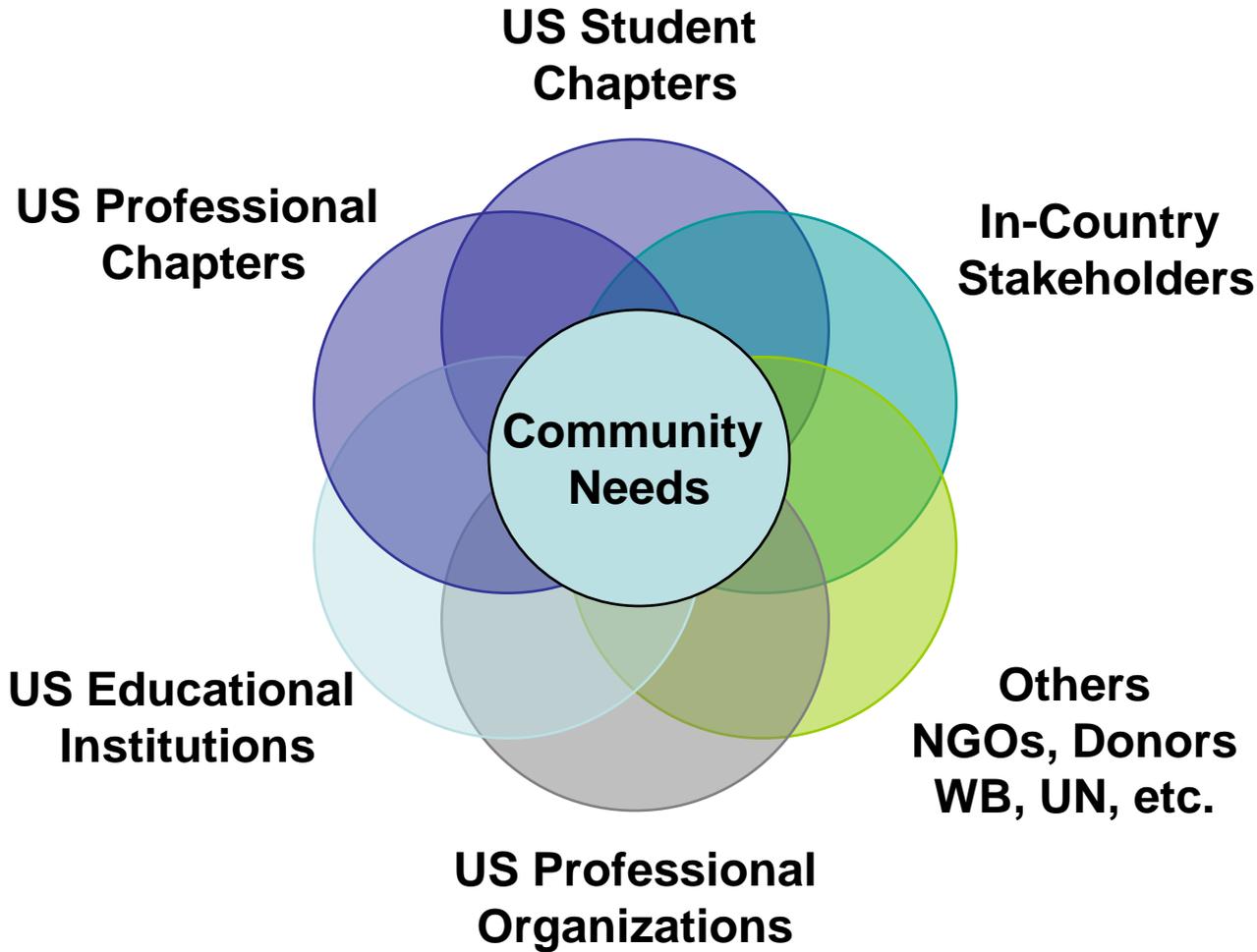
www.ewb-usa.org

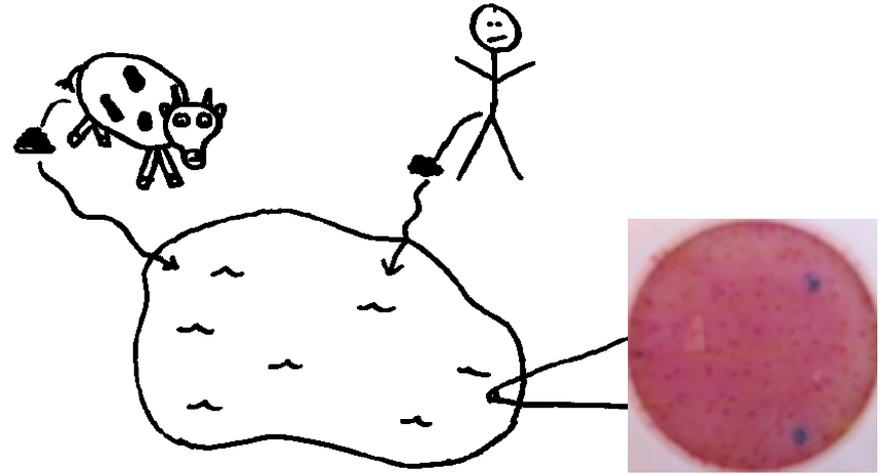


- Partners with disadvantaged communities to improve quality of life
- Implements sustainable engineering projects
- Develops internationally responsible engineers and engineering students
- Involves 14,000 members, 269 chapters, 311 projects in 43 countries



EWB-USA Project Stakeholders





Namsaling, Nepal



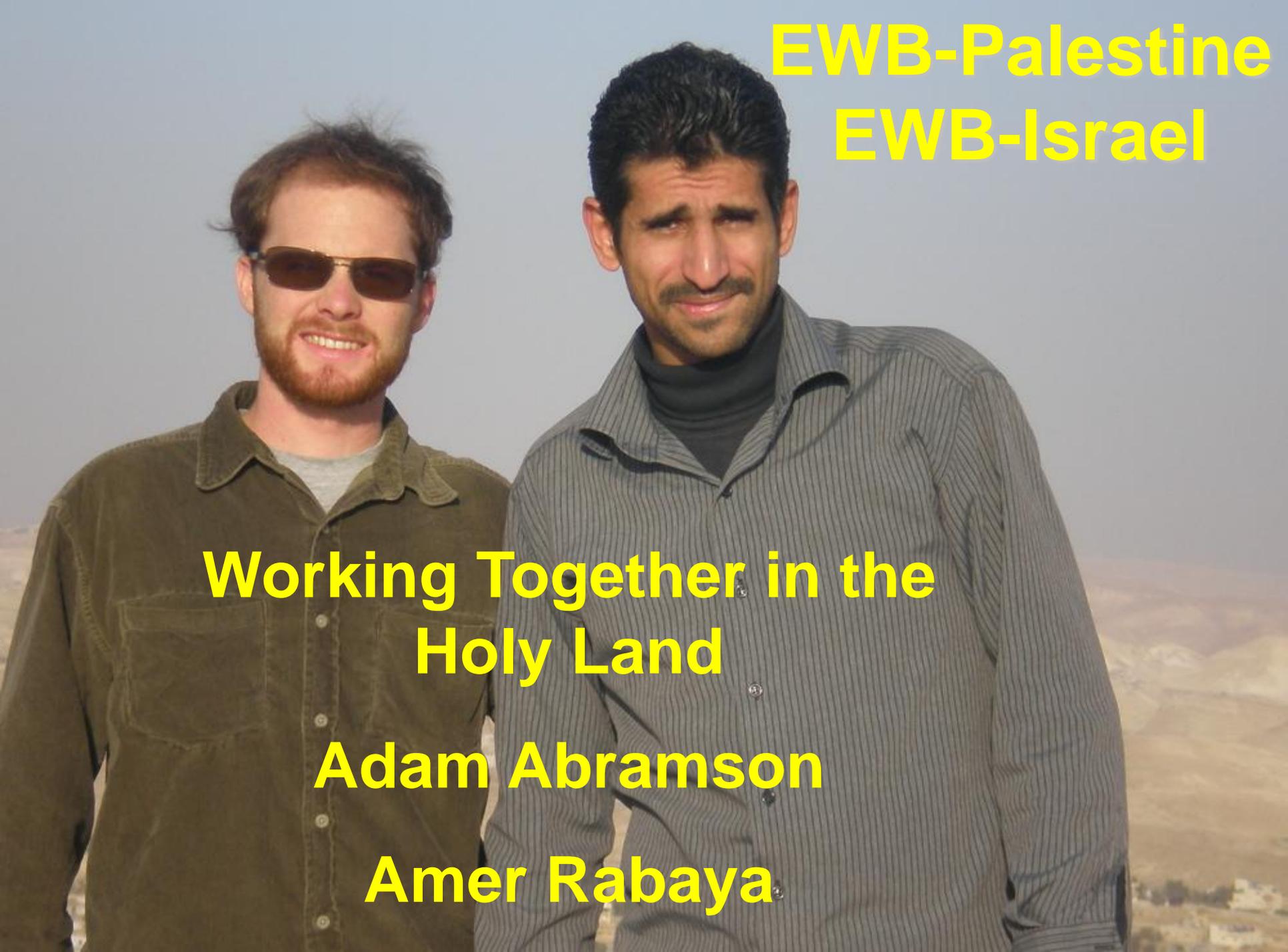
Solar Computers, Solar Lighting, Surgery Tools



Muramba, Rwanda







**EWB-Palestine
EWB-Israel**

**Working Together in the
Holy Land**

Adam Abramson

Amer Rabaya

Demonstration house for West Bank / Bedouin



- Solar powered, off-grid application for rural areas
- Construction planned for Bethlehem (summer 08)
- Vision: Education, Demonstration of Appropriate Technologies: Sustainable housing - Gray water Reuse – Solar - Drip Irrigation - Sanitation

Our Challenge

Recruitment of engineers and technicians

- EWB or BWE
- There is less than one scientist or engineer for every 10,000 people in Africa – compared to 2 to 5 per 1000 in Europe and USA. *UNESCO*

Education of engineers and technicians who:

- have the skills and tools appropriate to address critical world issues (hard and soft)
- are flexible and resourceful enough to deal with unfamiliar equipment and community problems
- are system thinkers who are able to consider the unintended consequences of their “solutions”

“The significant problems we face cannot be solved by the same level of thinking that created them”

Albert Einstein



www.ewb-usa.org

www.edc-cu.org