Overview

* Global View of Poverty
* Experience Drilling a Water Well
* How Living Water got started (Video)
* How you can get involved!
Poverty is the lack of basic human needs because of the inability to afford them.
- clean water, nutrition, health care, education, clothing and shelter
- Also referred to as absolute poverty or destitution.

Relative poverty is the condition of having fewer resources or less income than others within a society. (America)

- About 1.7 billion people live in absolute poverty.
- Before the industrial revolution, wealth was scarce, and poverty was considered normal.

Encyclopedia Britannica, "Poverty"
Poverty Pictures

- Zimbabwe
- Dem Rep of Congo
- Nicaragua
- Haiti

Poverty

Poverty Indicators
- Life Expectancy
- Infant Mortality Rate
- Gross Domestic Product (GDP)/Gross National Income (GNI)
- Access to Clean Water
- Human Development Index (HDI)
- Literacy Rate

Poverty is a cycle.

Famine Stricken Child being Stalked by a Vulture during Sudan Famine in 1994

http://en.wikipedia.org/wiki/Kevin_Carter
Includes:
- Life expectancy at birth
- Mean years of schooling
- Standard of living: GNI per capita

http://en.wikipedia.org/wiki/Human_Development_Index
The median annual income in the United States is $46,326.

http://fedupusa.org/2010
http://www.worldvision.org/content.nsf/sponsor
*Water & Sustainable Development*

WATER

The Foundation of All Sustainable Development

The "Bottom Billion"
*Drilling Wells in Nicaragua*

**Map of Nicaragua**

- **Location**: Nicaragua
- **Cities**: Managua, Granada, León, Masaya, Jinotepe, Intibucá, Rivas
- **Lakes**: Managua, Ometepe, Izalco
- **Mountains**: Maderas, Momotombo, Volcán San Cristóbal
- **Coasts**: Caribbean, Pacific

**Provisioning:** Providing a cup of water in Jesus' name.
*Drill Site in Village*
Technical Side

- Drilling Water
- Tie-Downs
- Settling Pit
- Mud Pump
- Tool Box
- LS-100 Drill Rig
- Drill Pipe
- Drill Bit
DIGGING DEEPER
Exactly how deep is a deep well? How shallow is a shallow well?

Hollywood Sign: 50 feet
Hand-dug well: Up to 50 feet
Leaning Tower of Pisa: 179 feet
Shallow Well: 200 feet
Sears Tower: 1,450 feet
Deep Well: 1,500 feet
An **aquifer** is a wet underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be usefully extracted using a water well.

Most land areas on Earth have some form of aquifer under them, sometimes at significant depths.

http://en.wikipedia.org/wiki/Aquifer
* Technical Q&A: Siting a Well

* Subsurface Conditions
* Subsurface Soil Types
* Vegetation
* Topography
* Surface Water
* Possible Sources of Contamination
* Accessibility to Users

* Want to drill EASY boreholes! (Stop if formation is too hard)
* Technical Q & A: Problems

* Most common problems leading to unsuccessful well completion:
  * Drilling in conditions beyond capability of equipment (formations too hard)
  * Unsuitable drilling mud resulting in borehole caving
  * Failure to get casing to bottom of borehole
  * Poor gravel pack around the screen
  * Inadequate well development
Technical Q&A: Signs of Water

* Sand and/or gravel cuttings
* Significant increase in speed of drill
* Gravel may cause bit to bounce
* Drilling fluid/mud starts to thin
* Loss in circulation and drop in drilling fluid level (highly permeable formation)
* Drilling fluid temperature may drop

* Drill log kept to document cuttings, depth, drill speed, etc.
Hygiene Training
*How did Living Water International get Started?

http://water.cc/living-water/resources/videos/

The Birth of Living Water International

* Compassion for People

* Technical Expertise

* PERSEVERANCE!!!
You can do something!!

- Raise money for a non-profit organization.
- Volunteer your skills.
- Go on a mission trip.
- Get involved with an organization.
- Raise awareness.
- Start something.

Chevron Houston Marathon 2011
* Organizations

* Engineers Without Borders
* Engineering Ministries International
* Living Water International
* The Wells Project (Texas A&M Chapter)
* H2O Africa Foundation
* Hydrate Hope
* Shell Project Better World

* $148 million on social investment in 2008
Questions?