

*Poverty, Clean Water, & Being Proactive

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* Overview

- * Global View of Poverty
- * Experience Drilling a Water Well
- * How Living Water got started (Video)
- * How you can get involved!

* Poverty

- * *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"

Krugman, Paul, and Robin Wells. *Macroeconomics*. 2. New York City: Worth Publishers, 2009. Print.

Poverty Pictures



Zimbabwe



Dem Rep of Congo



Nicaragua



Haiti

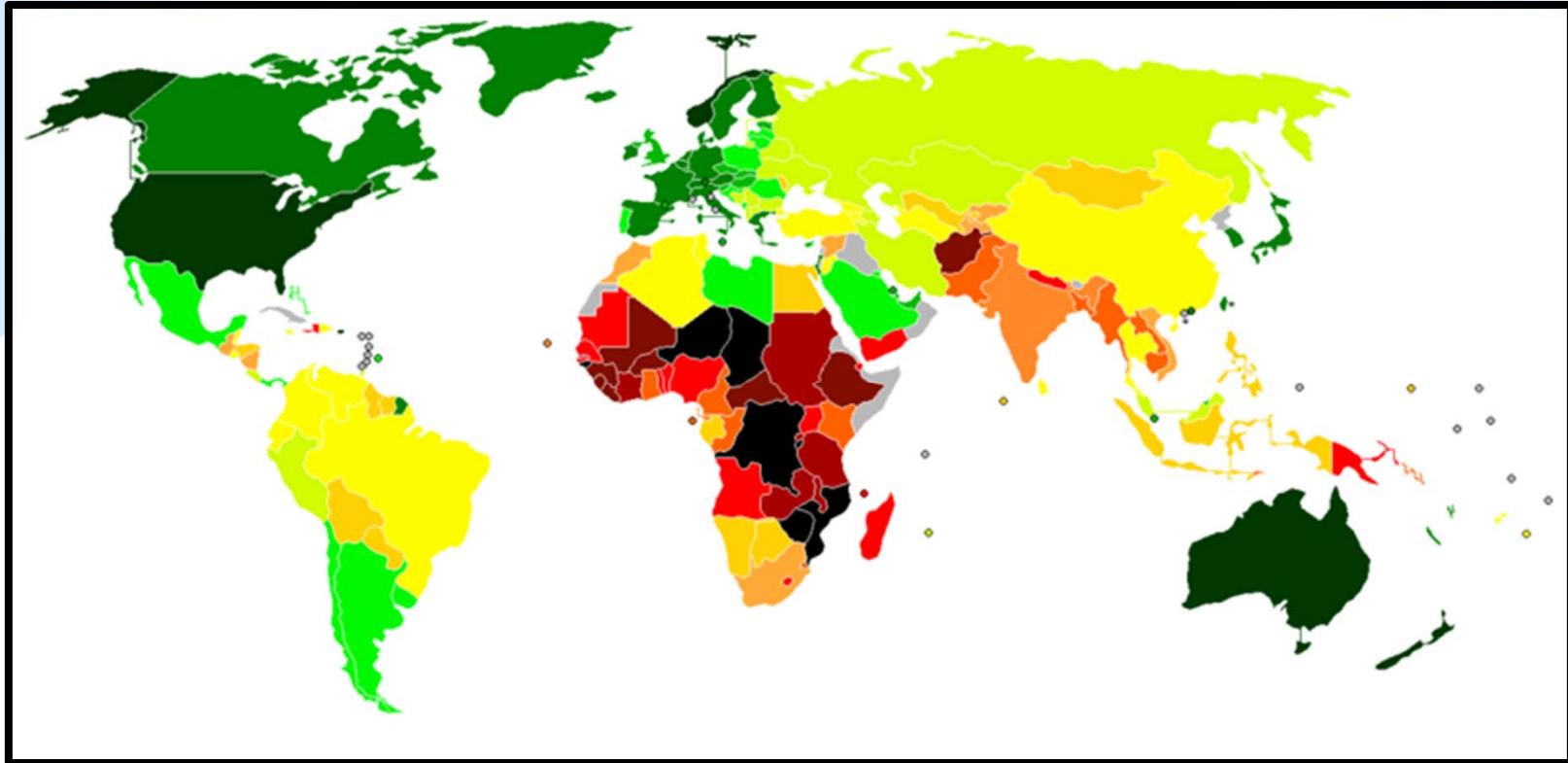
* Poverty

- * 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.



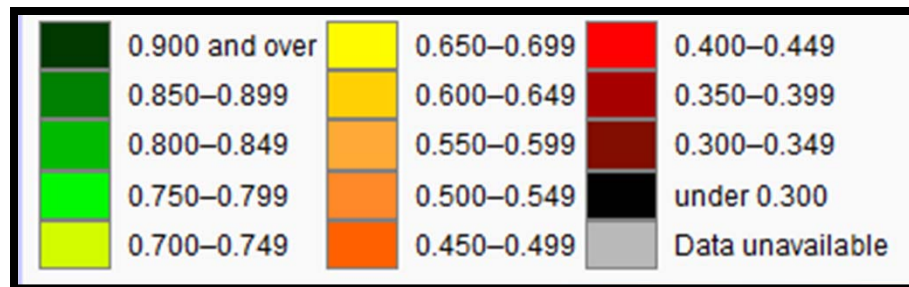
Famine Stricken Child being Stalked by a Vulture during Sudan Famine in 1994

Human Development Index Map

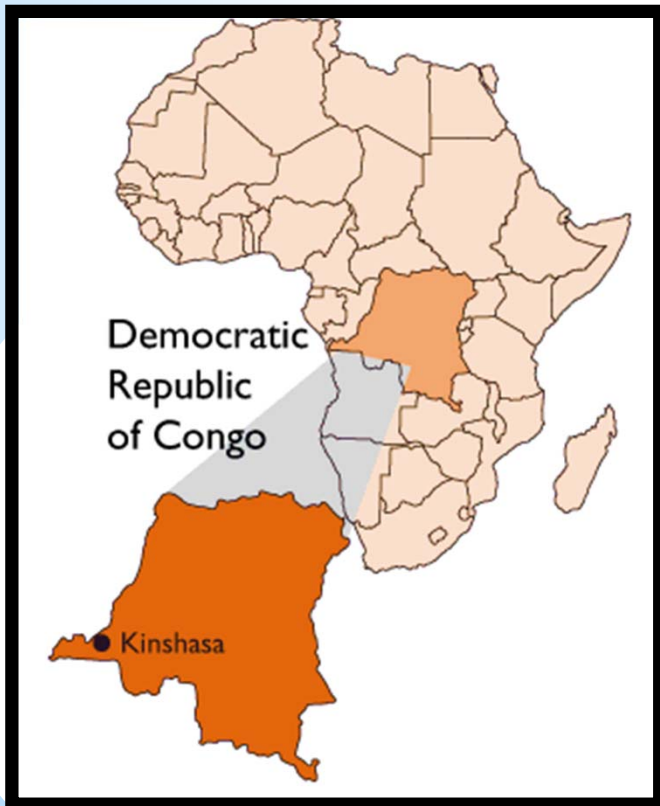


Includes:

- Life expectancy at birth
- Mean years of schooling
- Standard of living: GNI per capita



One Example

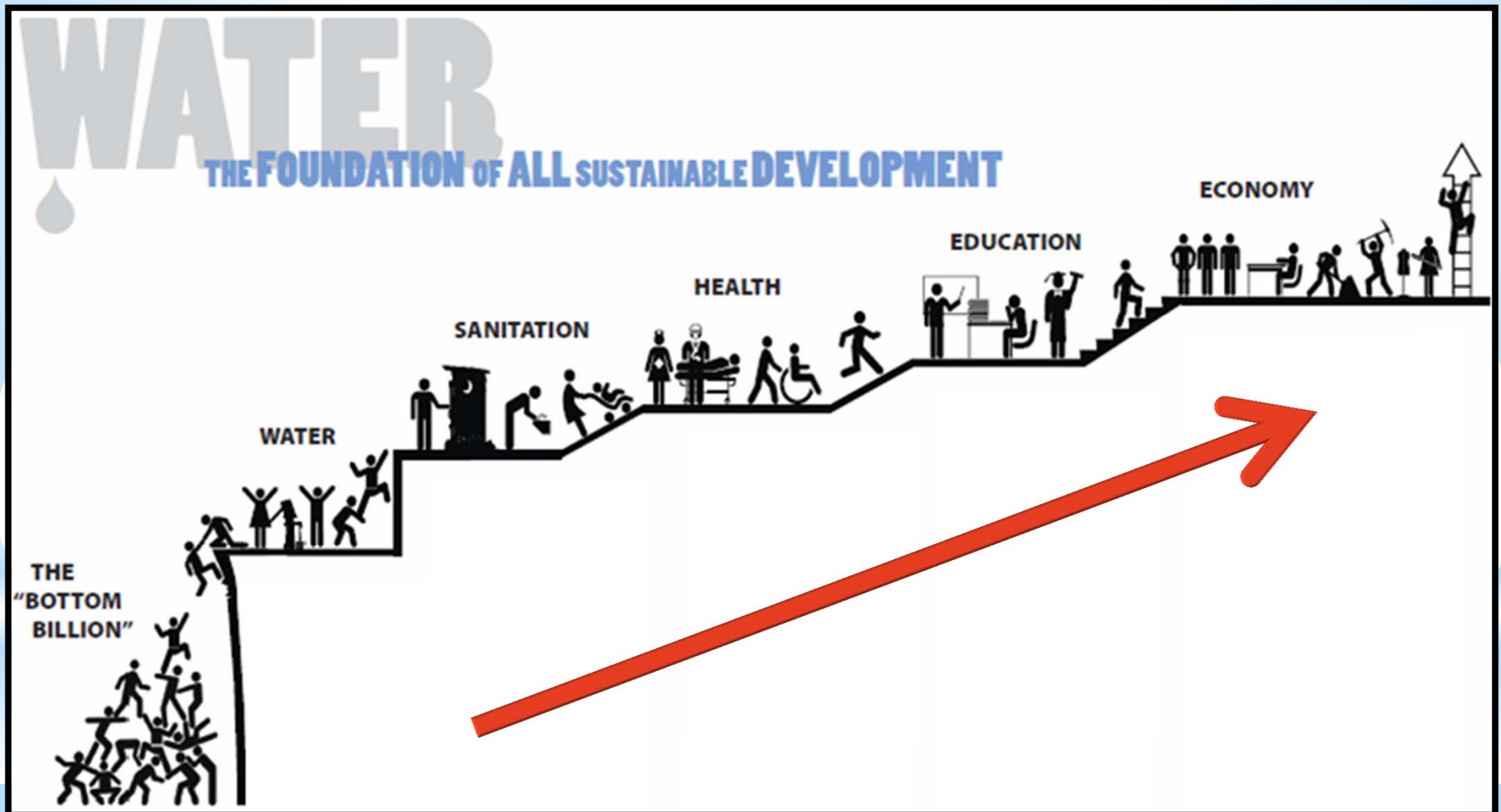


Country Statistics

| | |
|---|-------------------|
| Population | 57.5 million |
| Land Mass | 875,520 sq. miles |
| Life Expectancy | 51 years |
| Infant Mortality Rate | 129 / 1,000 |
| Literacy Rate | 67% |
| School Enrollment | N/A |
| Access to Safe Water | 46% |
| Average Annual Income (GNI per capita) | US\$120 |

The median annual income in the United States is \$46,326.

*Water & Sustainable Development



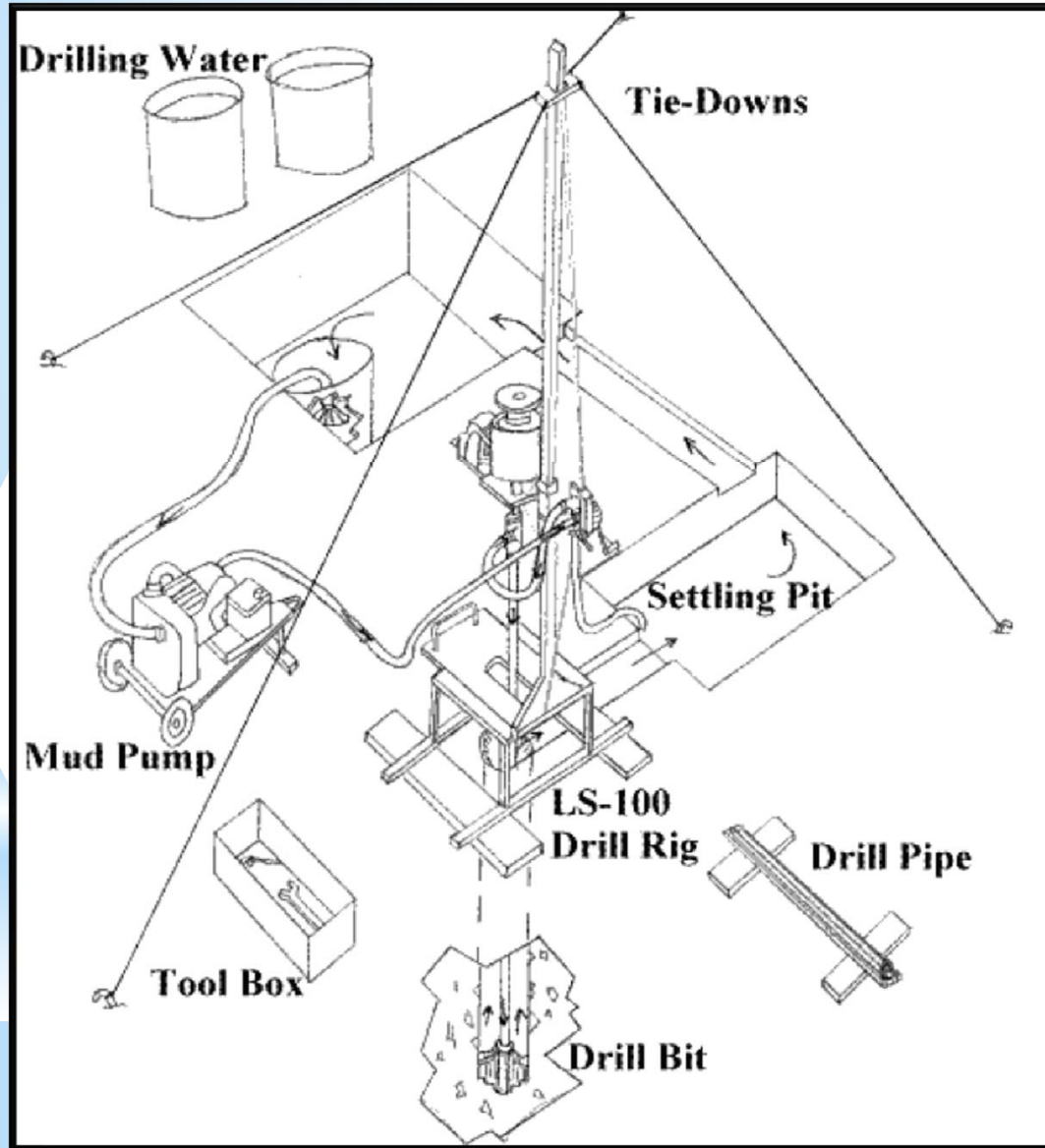
*Drilling Wells in Nicaragua



*Drill Site in Village



* Technical Side

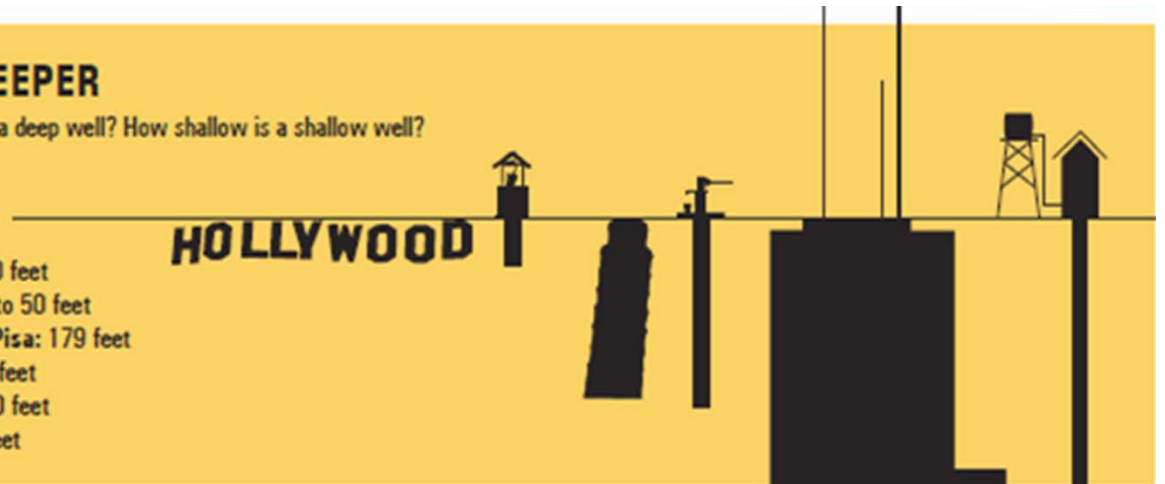




DIGGING DEEPER

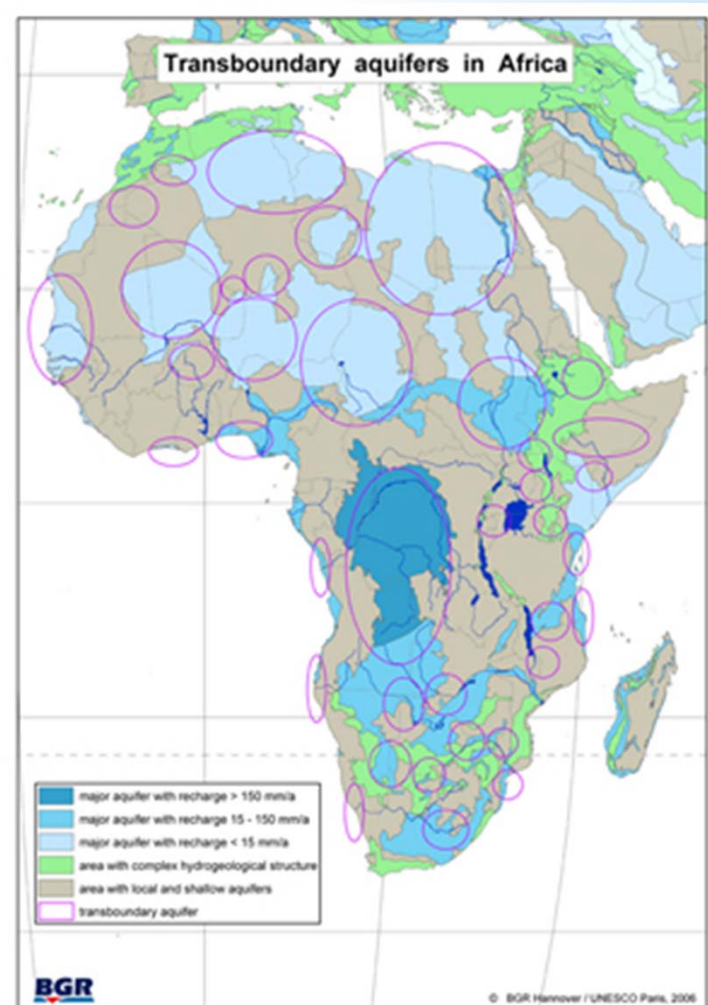
Exactly how deep is a deep well? How shallow is a shallow well?

- 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



* Technical Q&A: Aquifers

- * 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.



Major Aquifers in Africa

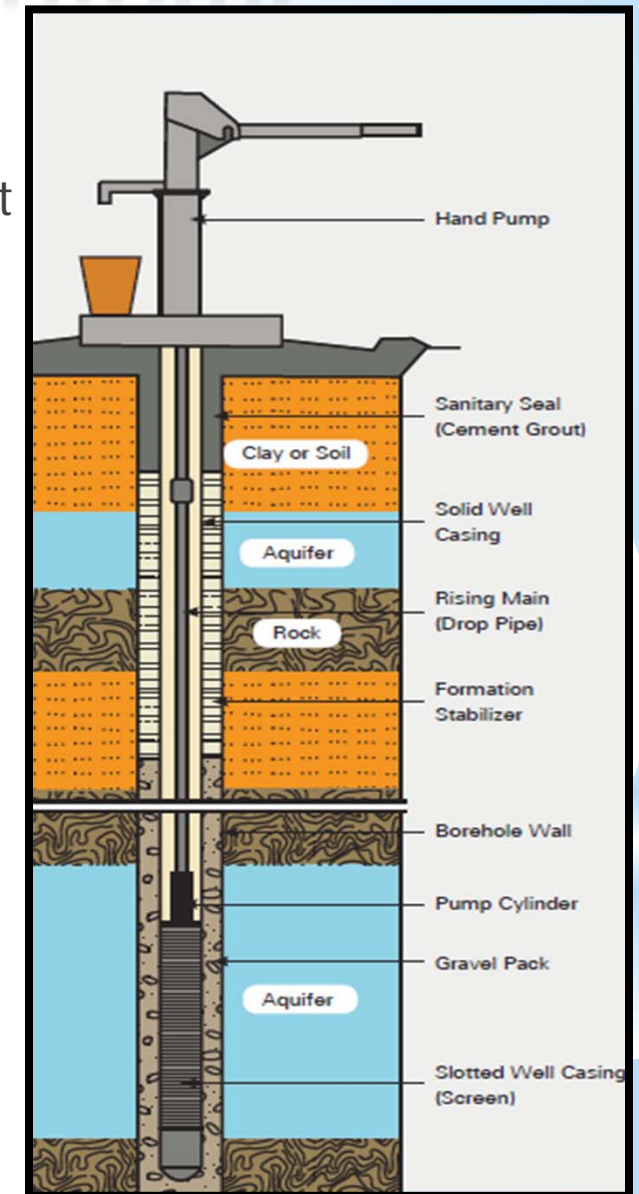
* Technical Q&A: Siting a Well

- * 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.



*WATER!!!!



* 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?**