

# *Clean Water in Developing Countries*

*April 12, 2011*

**TEAM ALPHA**

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# Overview

- Motivation
- The Front Lines
- First Hand Experience
- Play Pumps
- Solar Purification
- Water Filtration
- Summary



# Motivation



## The Story of the Thirsty

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



# Motivation

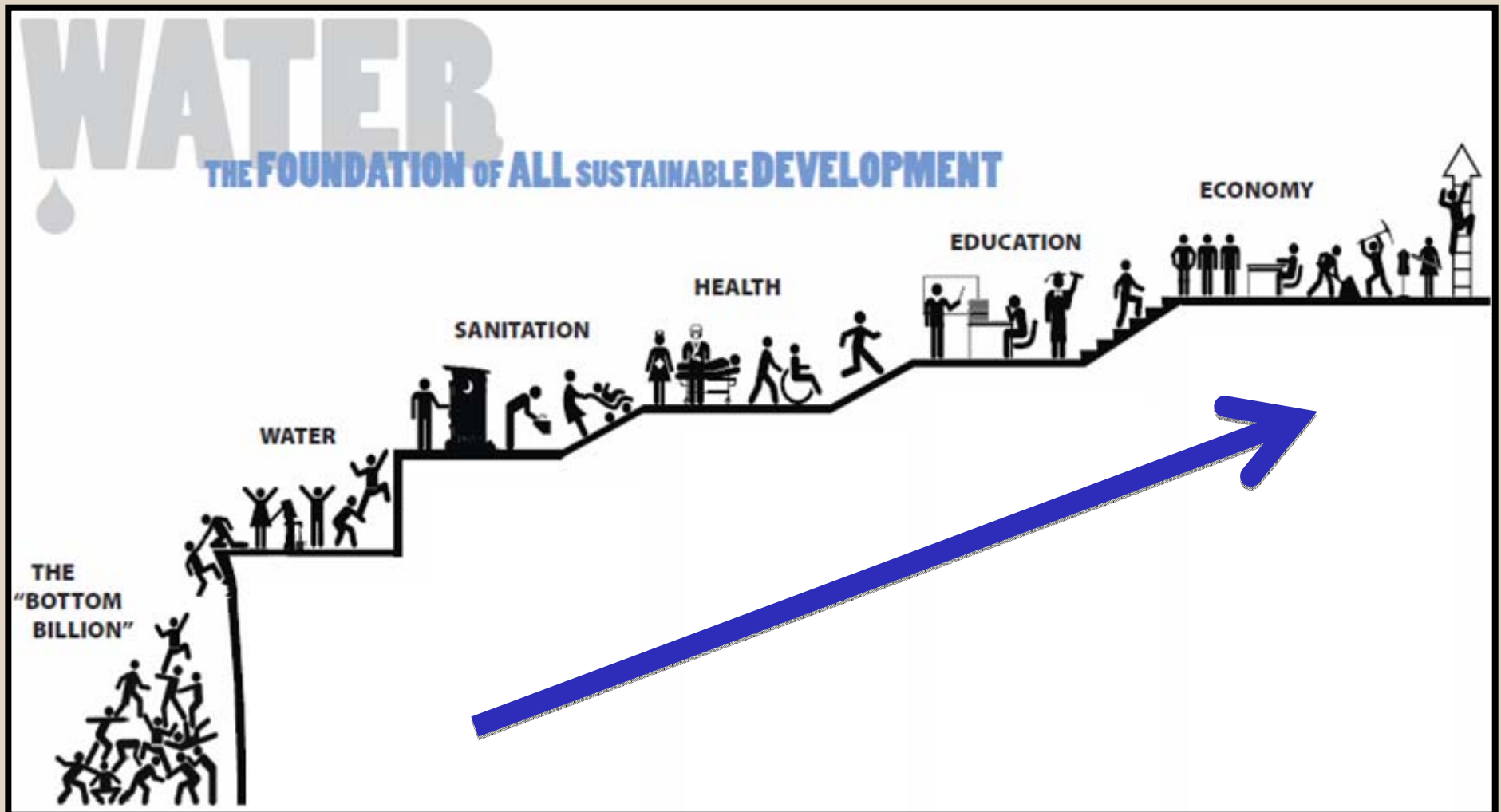
- Approx. 1/7 of the world without water
- Water responsible for a fourth of all child deaths before 5 worldwide
- Water is the key to the future for third world countries
  - Health
  - Hunger
  - Poverty
  - Education



# Motivation



TEXAS A&M  
UNIVERSITY



# The Front Lines



TEXAS A&M  
UNIVERSITY

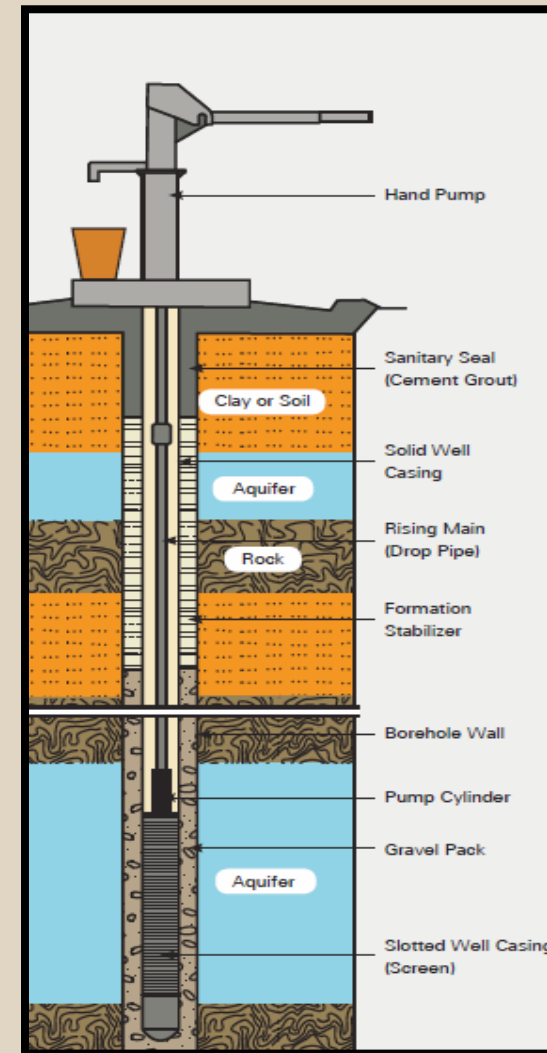
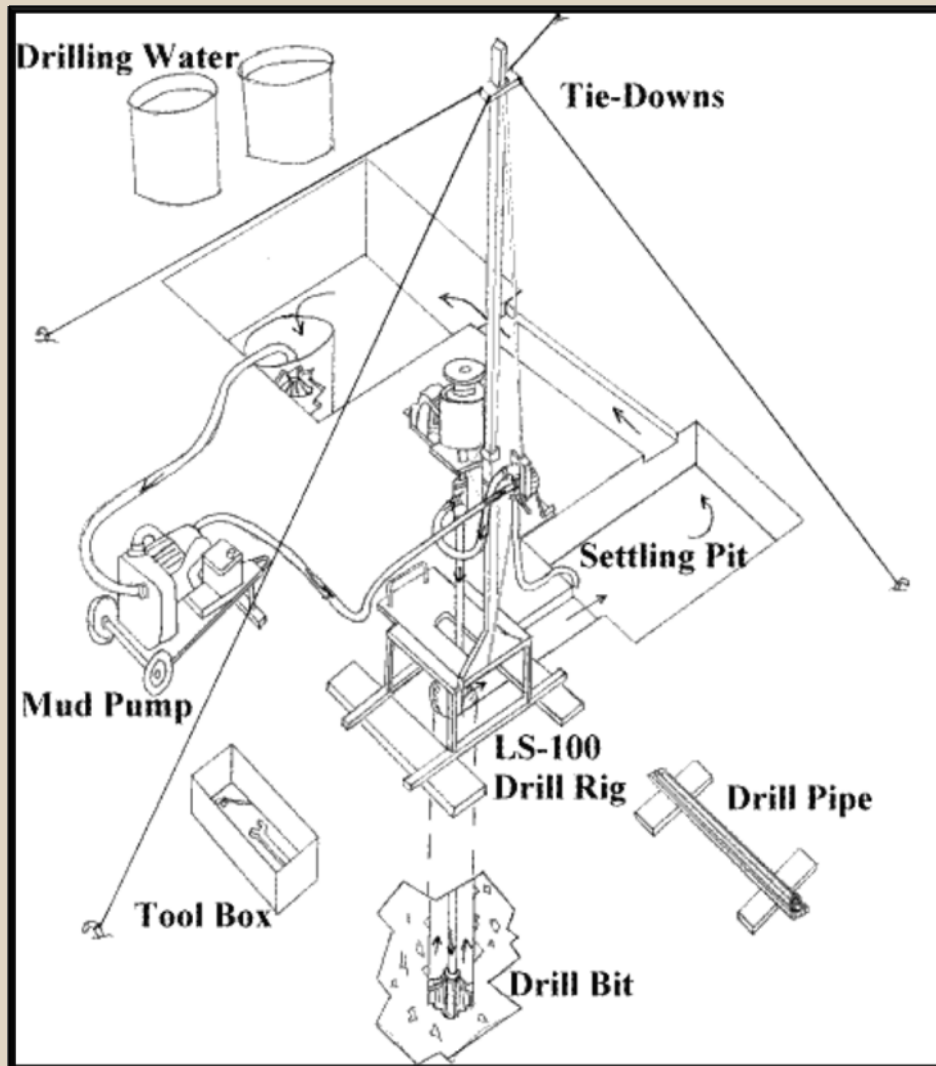


PROVIDING A  
CUP OF WATER  
IN JESUS' NAME

# Personal Experience



# The Technical Side



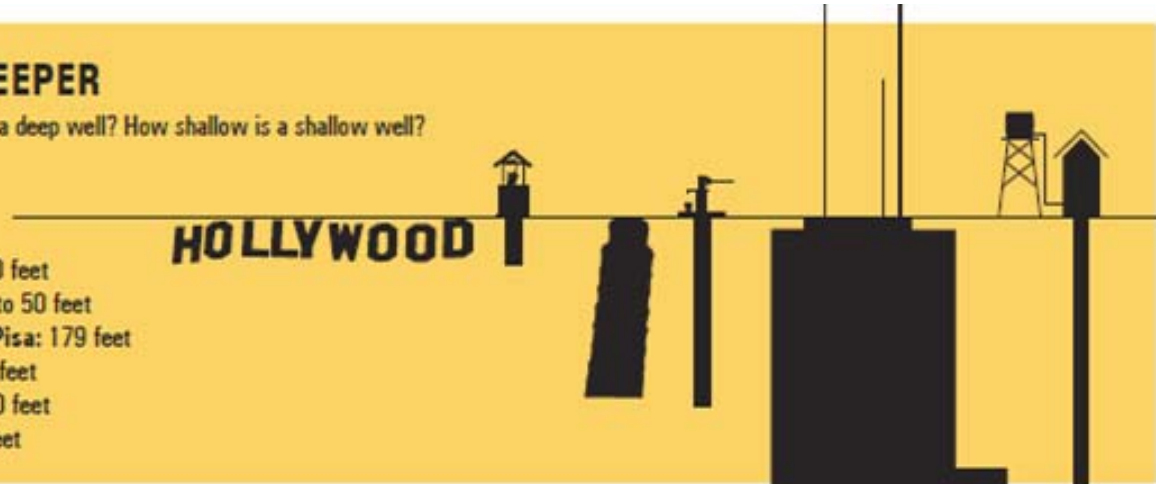




## DIGGING DEEPER

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



# The Technical Side



# WATER!!!!

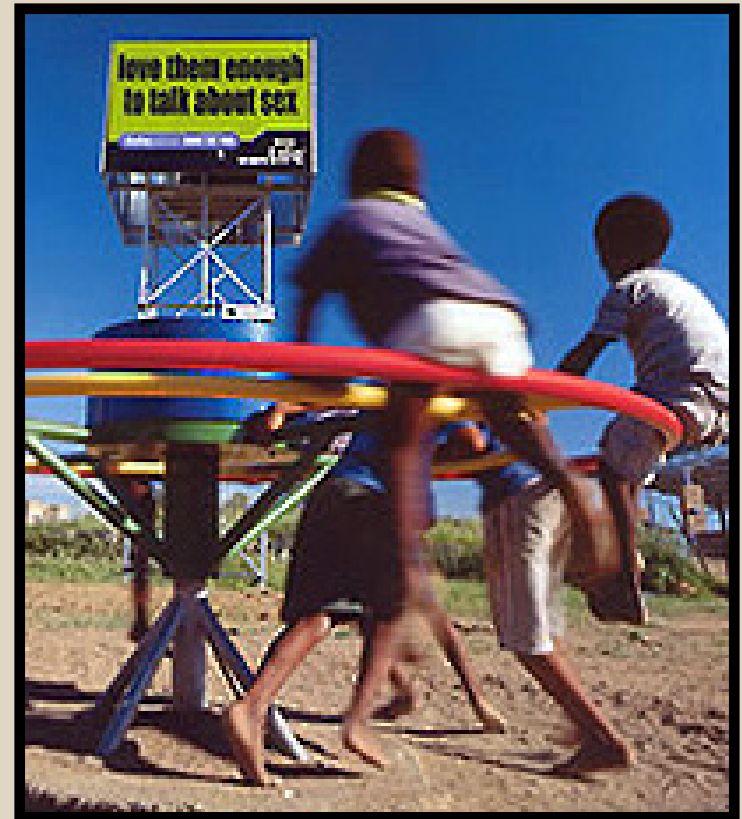


# Personal Experience



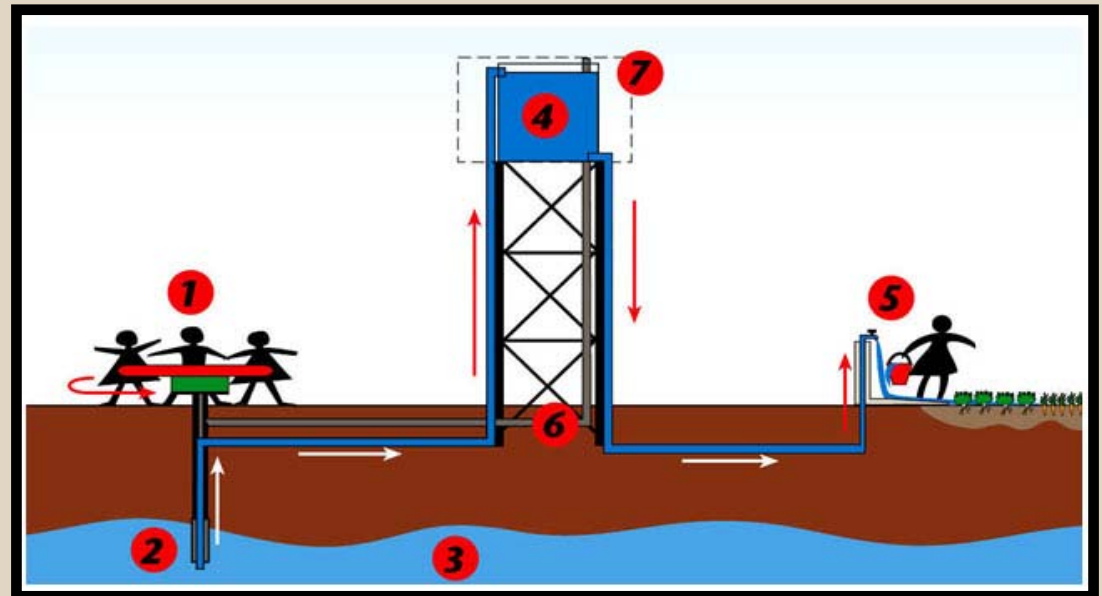
# Playpumps

- Installed 700 Playpumps
- South Africa, Lesotho, Malawi and Swaziland
- Storage tank
- Revenue generated for maintenance
- Installed near broken hand pumps



# How Playpumps Work

- 1) Children play
- 2) Clean water
- 3) 2,500-liter tank
- 4) Tank above ground
- 5) Simple tap
- 6) Excess water
- 7) Advertising



**Capabilities:** 1,400 liters of water per hour at 16 rpm from a depth of 40 meters

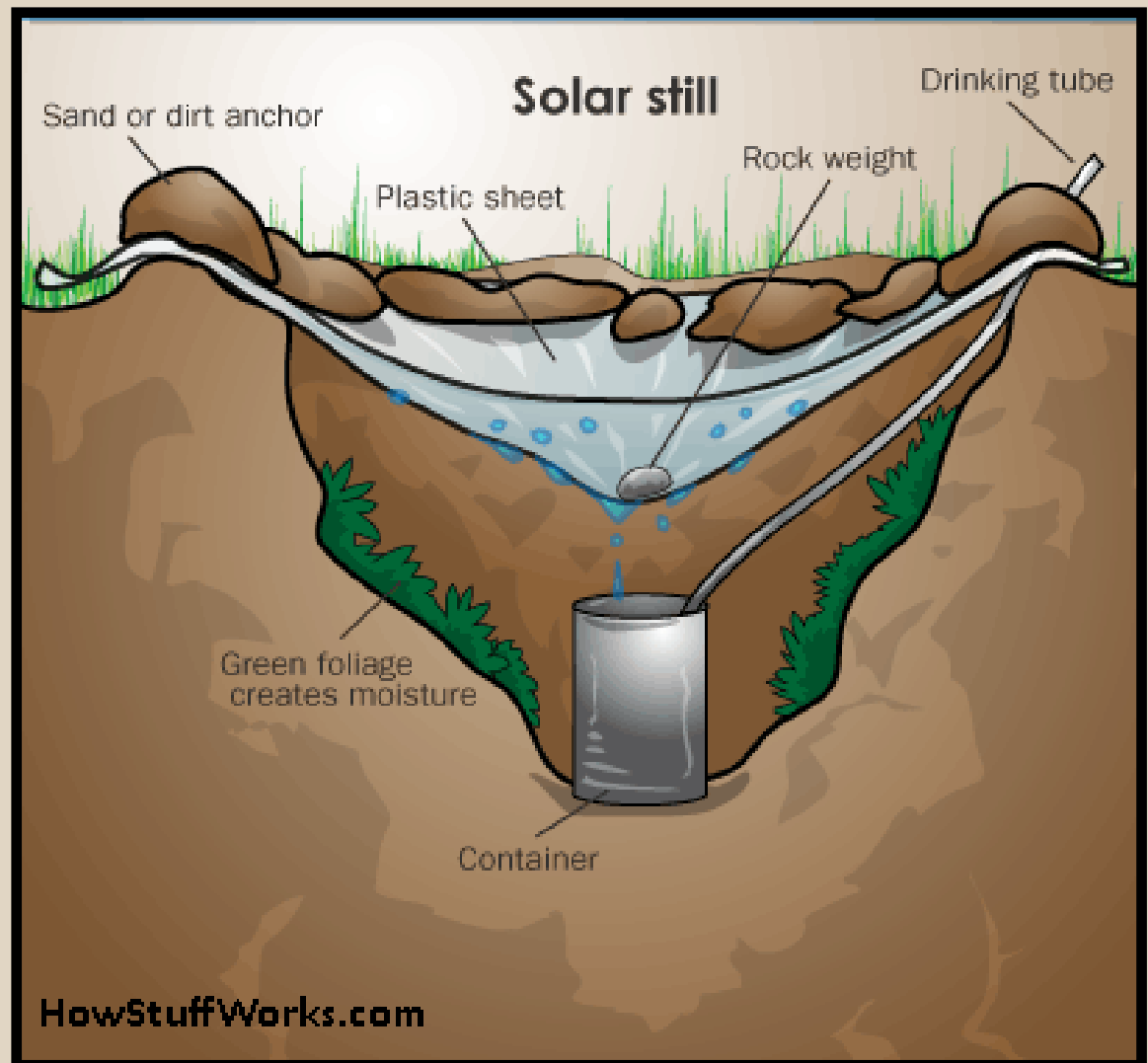
# Benefits of Playpumps



- Reduces walking time for women
- Attendance at schools increased
- Reduction in Diarrhea by 39%
- Sustainable
- Reliable

# Solar Purification

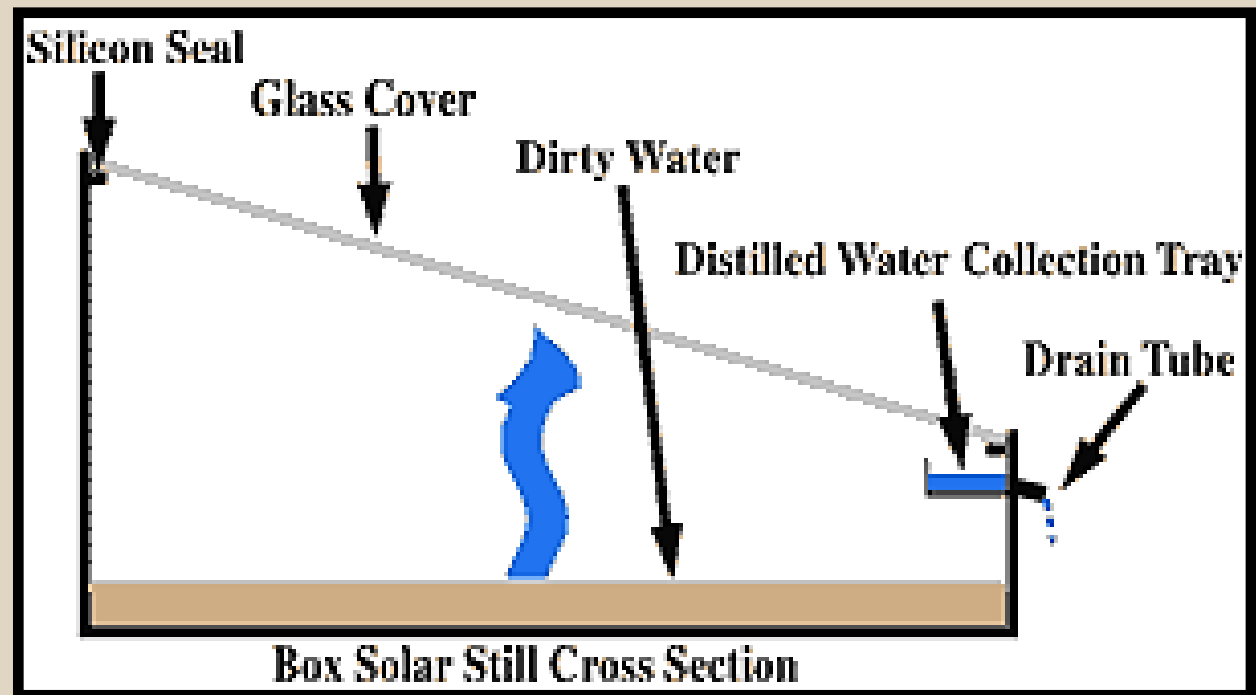
- Basic concept
- Small scale
- Foliage or dirty water around cup
- Greenhouse structure





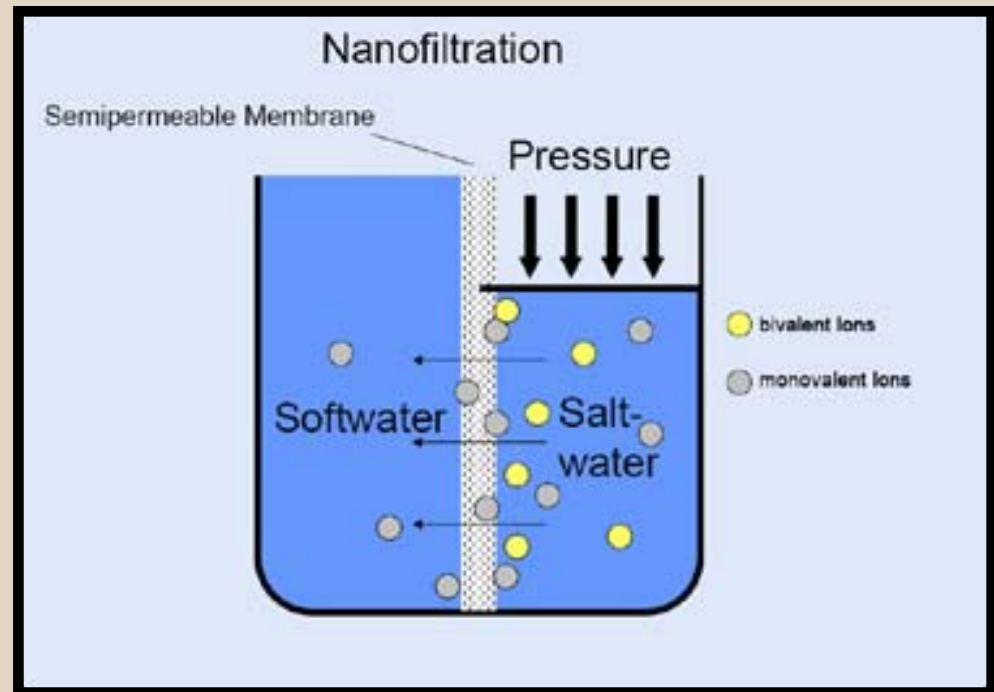
# Solar Purification

- Input: unclean water
- Shallow layer of water 20 to 40 mm
- Evaporation
- Shelves
- Cleaning: fungus bacteria

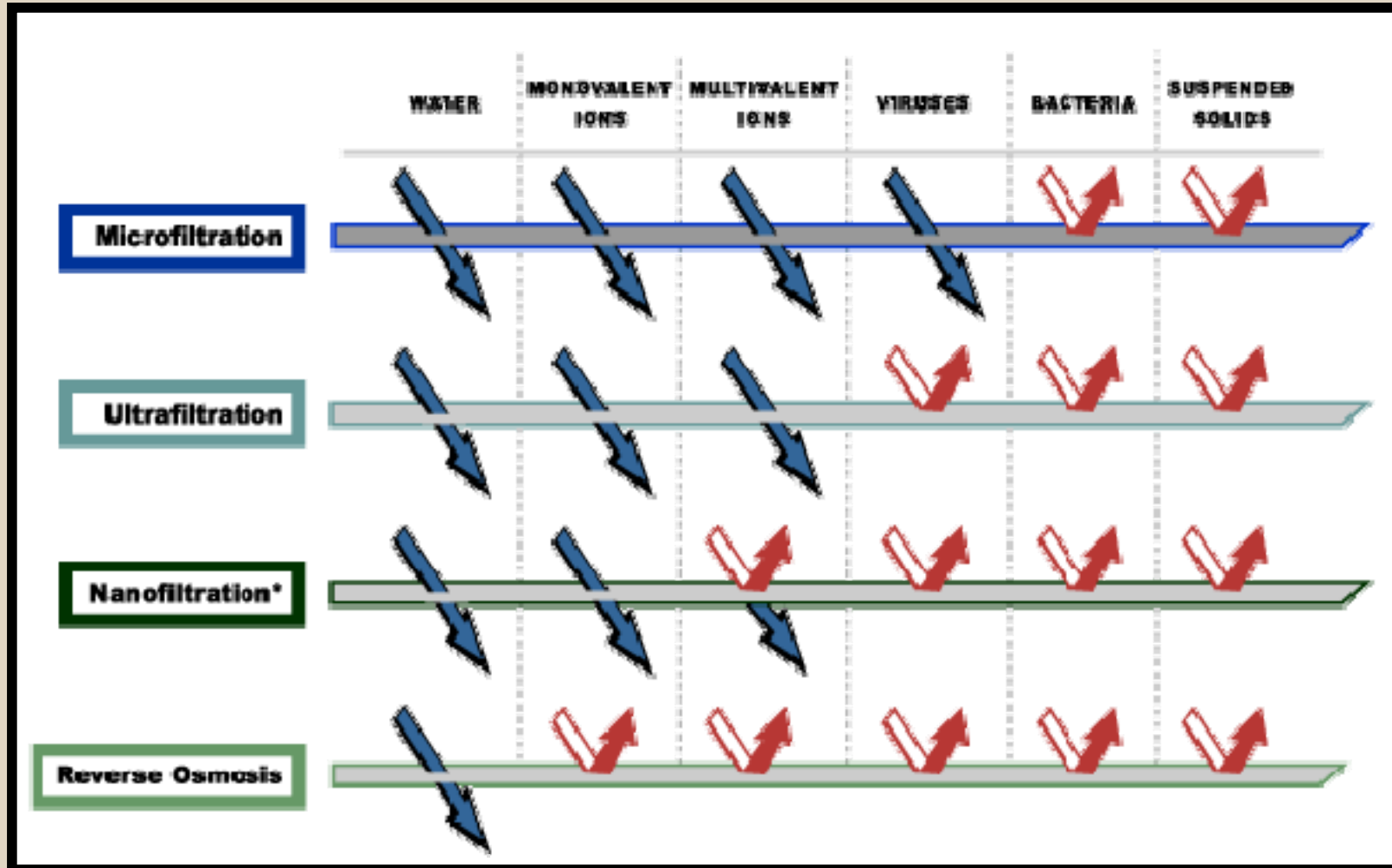


# Water Filtration

- Pressure applied
- Membrane made of ceramics or nanofibers
- Harmful substances can not pass through



# Filtration Methods



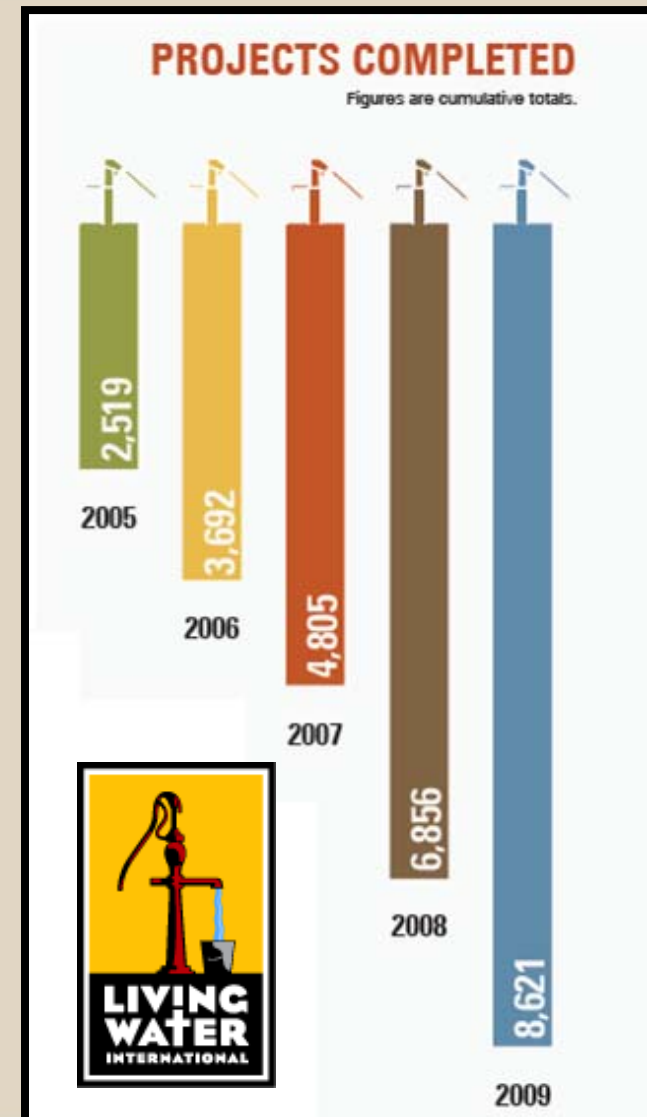


# Filtration Pros and Cons

- Pros
  - Provides extremely clean drinking water
  - Low cost
- Cons
  - Difficult to set up on a large scale
  - Requires training to use properly
  - Filters need to be replaced

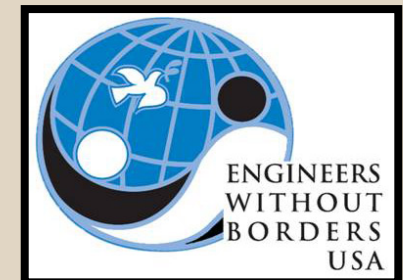
# Summary

- It all starts with water.
  - Health
  - Education
  - Women
  - Economy
- 1 billion people do not have access to clean water.



# Summary

- You can do something about it!
  - Raise money for a non-profit organization.
  - Volunteer your skills.
  - Go on a mission trip.
  - Get involved with a non-profit organization.
    - Living Water International
    - Engineering Ministries International
    - Engineers Without Borders
  - Raise awareness.



# References

- [http://thewaterproject.org/why\\_water.asp](http://thewaterproject.org/why_water.asp)
- [http://www.treehugger.com/files/2005/10/the\\_roundabout.php](http://www.treehugger.com/files/2005/10/the_roundabout.php)
- <http://hubpages.com/hub/solar-water-distiller-solar-still>
- <http://www.fumatech.com/EN/Membrane-technology/Membrane-processes/Nanofiltration/>
- <http://theceramicengineeringqbloq.blogspot.com/2009/11/what-is-nanofiltration.html>