

DESIGN CHALLENGE: How might we improve access to clean water for personal, agricultural or industrial use?

Note: This is a guiding statement to assist you in choosing a problem. The problem you choose should be focused and specific.

THE PROBLEM

“Overcoming the crisis in water and sanitation is one of the greatest human development challenges of the early 21st century,” a recent U.N. report warns.

Lack of clean water is responsible for more deaths in the world than war. About 1 out of every 6 people living today do not have adequate access to water, and more than double that number lack basic sanitation, for which water is needed. In some countries, half the population does not have access to safe drinking water, and hence is afflicted with poor health. By some estimates, each day nearly 5,000 children worldwide die from diarrhea-related diseases, a toll that would drop dramatically if sufficient water for sanitation was available.

Globally, water is available in abundance. It is just not always located where it is needed. Some regions are awash in fresh water while other regions, afflicted by drought, go wanting. In many instances, political and economic barriers prevent access to water. And in some developing countries, water supplies are contaminated not only by the people discharging toxic contaminants, but also by naturally occurring poisonous pollutants found in groundwater aquifers.

Water for drinking and personal use is only a small part of society’s total water needs — household water usually accounts for less than 5% of total water use. In addition to sanitation, most water is used for agriculture and industry. Water is also needed for ecological processes not directly related to human use. Developing methods to ensure adequate water supplies is vital for a healthy, sustainable future for the planet.

Resources

National Academy of Engineering Grand Challenges for Engineering: www.engineeringchallenges.org (Access to Clean Water); Multiple references provided on this website

Drawdown, The Most Comprehensive Plan Ever Proposed to Reverse Global Warming, Paul Hawken

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