WATER FACTS

© Markus Spring

More Water, Less Waste: Improving Global Sanitation and Freshwater Access with Waterless Toilets and Rainwater Harvesting

Around the world, temperatures are rising, and sources of freshwater are increasingly unreliable. Two and a half billion people already do not have access to basic sanitation, and nearly eight hundred million people lack access to safe drinking water.[1] Adding to the problem, global warming is expected to cause more floods and droughts, both of which reduce the availability of safe, clean and fresh water for drinking, sanitation, irrigation, and other basic needs. Fortunately, technologies such as waterless toilets and rainwater harvesting can be deployed immediately, and cost-effectively, to improve sanitation, protect existing supplies of freshwater, and create new, safe water sources.

DELIVERING WATER AND SANITATION SERVICES WHERE THEY ARE NEEDED MOST

Approximately two million people die each year of entirely preventable diarrheal diseases due to a lack of access to safe water and sanitation, and most of these deaths are in children under the age of five.[2] The Intergovernmental Panel on Climate Change (IPCC) noted that global warming exacerbates limited access to freshwater.[3] With more water shortages on the horizon, now is the time to invest in successful, cost-effective technologies such as waterless toilets and rainwater harvesting to conserve freshwater. These simple, sustainable technologies are particularly relevant in rural villages, arid regions, hurricane and disaster relief areas, and urban slums.

WATERLESS TOILET 101

A waterless toilet may look like a western-style seated toilet or a cost-effective squatting toilet, but instead of using water to flush human waste down a pipe and on to a treatment plant, the waste is diverted into separate liquid and solid storage tanks for collection and eventual recycling. Liquid waste can be stored in tanks long enough to decompose into plant-friendly nutrients such as potassium, phosphorus, and nitrogen. A scoop of sawdust or cold ash is added to solid waste to deodorize and dehydrate it, and then solid waste can be stored for 6 to 18 months (depending on the climate) until it decomposes into compost and fertilizer. Harmful bacteria and parasites die during the dehydrating process, leaving behind safe, nutrient-rich compost.

NRDC
THE EARTH'S BEST DEFENSE

For more information, please contact:

Elizabeth Shope
eshope@nrdc.org
(202)289-2379
switchboard.nrdc.org/blogs/eshope

Susan Egan Keane
skeane@nrdc.org
(202)289-2389
switchboard.nrdc.org/blogs/skeane

www.nrdc.org/policy
www.facebook.com/nrdc.org
www.twitter.com/nrdc

An example of a urine-diverting toilet that can be used with or without water.

Credit: Wostman Ecology

Waterless toilets can be significantly cleaner and safer than existing options if properly designed, used, and cleaned. Specially designed air shafts and solar or wind-powered fans can be used to improve ventilation, reduce odors, and inhibit insects from breeding and spreading disease. The lack of odor also means that waterless toilets—unlike pit latrines—can be built indoors, increasing comfort and convenience.

TURNING WASTE INTO WATER, FUEL, AND FERTILIZER

By converting waste products into useable resources, waterless toilets can have a number of benefits:

- Storage tanks for waterless toilets can be installed above-ground to prevent contamination of groundwater wells and other freshwater sources.
- Solid waste gives off methane and other gases while decomposing, and these can be captured and reused to provide energy for cooking or lighting. The bio-gas generated by one adult's solid waste provides enough energy to meet the daily energy needs of one person in the developing world.[4]
- Both liquid and solid waste can be reused as safe, environmentally friendly fertilizers, helping avoid the use of harmful chemical alternatives that can contaminate water and food.

HARVESTING THE RAIN

Rainwater harvesting is a time-tested practice of collecting rainwater during wet seasons and storing it for use during dry seasons. Technology varies from highly sophisticated, large-scale reservoirs and treatment plants to village-level collection with natural rock catchments. One of the most cost-effective methods for collecting clean drinking water is installing a corrugated milled steel or tiled roof with a gutter that is connected to a swiveled collection pipe. The swivel allows the initial rainwater flow, which may contain debris from the roof, to be diverted away from the clean water collection box. Additional filter materials can be added to the collection box to purify the water as it flows into a storage tank.

INCREASINGLY AFFORDABLE ACCESS TO FRESH WATER

Rainwater harvesting can provide communities with cost-effective access to water for drinking, irrigation, and other basic needs.

- Rainwater can be an important source of freshwater and can help communities adapt to increasingly unpredictable water supplies stemming from global warming.
- Rainwater provides some of the cleanest naturally-occurring water available, particularly in rural areas with low levels of exhaust or pesticide pollution.
- Rainwater can also be harvested as lower-quality water from natural or manmade catchments for animals, irrigation, laundry, and household cleaning.
- Rainwater can be treated inexpensively, including using disinfection tablets and solar disinfection (placing water in clear bottles for exposure to sunlight).
- Rainwater can be used where surface water does not exist or is contaminated, or where groundwater is inaccessible or of poor quality.

REACHING GLOBAL DEVELOPMENT GOALS BY MEETING CRITICAL WATER NEEDS

Improved sanitation and access to drinking water are preconditions for reaching many of the United Nation's Millennium Development Goals, including reducing poverty, hunger, and child mortality; and improving gender equality, environmental sustainability, and maternal health. Using water conservation technologies such as waterless toilets and rainwater harvesting can be cost-effective in avoiding pollution of existing water resources, achieving stability and security in impoverished regions by avoiding massive migration motivated by lack of water, preventing violence sparked by conflicts over water resources, and adapting to climate change—starting today.

[1] World Health Organization/United Nations Children's Fund. Progress on Drinking Water and Sanitation: 2012 Update. http://www.who.int/water_sanitation_health/publications/2012/jmp_report/en/index.html. Last accessed March 9, 2012.

[2] World Health Organization. Water Sanitation and Health. Water-related Diseases. Diarrhoea. http://www.who.int/water_sanitation_health/diseases/diarrhoea/en/. www.who.int. 2011. Accessed March 7, 2012.

[3] Intergovernmental Panel on Climate Change (IPCC). Fourth Assessment, *Climate Change 2007: Synthesis Report*, p. 49. http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html. www.ipcc.ch. Accessed March 7, 2012.

[4] Woodrow Wilson Center for Scholars. Environmental Change and Security Program (Navigating Peace Initiative*), Water Stories: Expanding Opportunities in Small-Scale Water and Sanitation Projects*, p. 63. www.wilsoncenter.org. http://www.wilsoncenter.org/publication-series/water-stories-expanding-opportunities-small-scale-water-and-sanitation-projects-0. July 7, 2011. Accessed March 7, 2012.