

A CLOSER LOOK:

WATER & POVERTY

BY PAUL DARILEK

The Water Project

www.TheWaterProject.org

THE POOREST PEOPLE IN THE WORLD ACTUALLY PAY SOME OF THE WORLD'S HIGHEST PRICES FOR DRINKING WATER, AND THE WATER THEY GET IS LESS CLEAN AND LESS PLENTIFUL. THE POOR PAY MORE IN THE FORM OF LOST TIME, HEALTH, EDUCATION, AND LIFE, BUT ALSO IN MONETARY TERMS. MORE THAN ANY OTHER FACTOR, WATER SCARCITY KEEPS THE "BOTTOM BILLION" ENTRAPPED IN A CYCLE OF EXTREME POVERTY. IN THE END ALL OF HUMANITY PAYS THE PRICE. THE GOOD NEWS IS THAT IT DOESN'T HAVE TO BE THIS WAY.

THE POOR PAY MORE?

People living in the slums of Nairobi, Jakarta, and Manila actually pay 5 to 10 times more for water than those in high income areas of those same cities. They even pay more than consumers in London or New York. The poorest 20 percent of households in El Salvador and Nicaragua spend on average more than 10 percent of their household income on water.¹ In the U.S. the median household spends only 1.1 percent of its income on water and sewage.² For the poorest of the poor, the water bill may be the world's most retrogressive tax—on life itself.

DEAD BABIES COST MONEY

Infant mortality is highest where clean water access is lowest. Every year 1.8 million children die from diarrhea, far more than armed conflict and terrorism combined.³ Picture a pre-school classroom blowing up every six minutes, day and night. The irony is that high infant mortality *increases* population. Demographers call it the "demographic-economic paradox." Elderly people in extreme poverty depend on their children for sustenance in old age. When people know some of their offspring will die, others will move away, and some will not be able help, they tend to have more children. So it is that India's former minister of population, Karan Singh, coined the phrase, "development is the best contraceptive."⁴ Studies show that access to safe water reduces child death rates by more than 20 percent in Uganda. In Peru a toilet in the home reduces infant death by more than 30 percent.⁵ The world over, the people with lowest reproduction rates are those who know their babies are not going to die.

WOMEN AND CHILDREN FIRST!

In Sub-Saharan Africa alone, 40 billion hours a year are spent mostly by women—just hauling water. That's equivalent to a year's labor for the entire workforce of France. The result, known as "time-poverty," affects women and girls most. About half the girls in Sub-Saharan Africa who drop out of primary school do so because of poor water and sanitation. At any given time close to half of the people in the developing world are suffering from one or more of the diseases associated with inadequate water and sanitation.⁶ Each year, 443 million school days are lost from water-related illness—equivalent to an entire school year for all seven-year-old children in Ethiopia.⁷ Lack of education keeps children from getting out of poverty. Lack of water deprives children from education.

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**443 MILLION
SCHOOL DAYS
ARE LOST FROM
WATER-RELATED
ILLNESS**

EVERY



\$8

INVESTED IN WATER AND SANITATION

WORTH OF TIME, PRODUCTIVITY, AND HEALTH



8:1 ROI

The payoff for water provision is big. Every \$1 invested in water and sanitation generates on average an \$8 return in the form of saved time, increased productivity, and reduced health costs.⁸ This does not even include new productivity made possible by water access. The long-term benefits of access to clean water would be felt by all of us in the form of decreases in economic aid, increased productivity, lower infant mortality, decreased population burden, increased educational opportunity, and decreased “time poverty”—not to mention the ethical payoff of giving life to those who most need it.

WHY DIDN'T I KNOW THIS?

You're not alone if you had never fully contemplated how lack of water keeps people in poverty. The world is only beginning to take a close look at the root causes of extreme poverty. Almost two in three people lacking access to clean water survive on less than \$2 a day. One in three lives on less than \$1 a day.⁹ Their world and their challenges are foreign to us. Dripping taps in rich countries lose more water than is available to the poorest billion people on earth.¹⁰ It's no surprise we've never put ourselves in their shoes and fully understood how water scarcity perpetuates this cruel cycle of poverty.

GOOD NEWS!

The good news is that there is more than enough water in the world for domestic purposes, agriculture, and industry. And the payoff for its more equitable distribution is great.

Gary Evans from our partner organization LWI puts it this way, “We're in a world where there are 900 million people barely treading water, and the water's too low for them to reach the ladder. They don't need a boat. They don't need a helicopter to rescue them. They just need a little boost so they can reach the ladder. Then they can climb out on their own. Clean water provides that boost.”

And if you want to reach out and give that boost, then you're in the right place.

Read more at thewaterproject.org



1. UNDP Human Development Report 2006, *Beyond Scarcity: Power, poverty and the global water crisis*, p. 7.
2. U.S. Environmental Protection Agency, *Water on Tap: What You Need to Know*, p. 11.
3. UNDP Human Development Report 2006, *Beyond Scarcity: Power, poverty and the global water crisis*, p. 3.
4. David N. Weil (2004). *Economic Growth*. Addison-Wesley, p. 111.
5. UNDP Human Development Report 2006, *Beyond Scarcity: Power, poverty and the global water crisis*, p. 6-7.
6. *Ibid.*, p. 47.
7. *Ibid.*, p. 22.
8. *Ibid.*, p. 58.
9. *Ibid.*, p. 82.
10. *Ibid.*, p. 6.

A CLOSER LOOK:

HEALTH & HYGIENE

BY PAUL DARILEK

The Water Project

www.TheWaterProject.org

WASH UP!

The World Health Organization says the single most cost-effective health intervention in the world is handwashing with soap, which alone could cut incidence of diarrhea in half! ¹

This year WHO declared October 15 “Global Handwashing Day.” Handwashing with soap at critical times (before eating, after using the bathroom, etc) would save more lives than any single vaccine or medical intervention known to humankind, but it’s only very recently being seen as a life-saving opportunity. ²

It sounds simple, but changing behavior is enormously difficult. Jodi Mohney, from our partner organization LWI, has been looking at this issue for years. Jodi’s interest in health and hygiene was born out of a passion for working with other moms. Her perspective was a great place to start because in the world of health, hygiene, and behavior modification, a knack for talking to moms can be worth more than an advanced degree in medicine.

The resulting health and hygiene course combines playful, memorable teaching techniques with tried-and-true hygiene practices appropriate for developing communities. It is taught by trained instructors and in-country nationals. Some of our partner teams in Africa and Latin America are even training others in their own countries to teach hygiene.



GERMS, TERROR, GLITTER.

Germs kill many more people every day than terrorists do, but they don’t grab our attention. How do you teach people to be aware of something they can’t even see? One way is to put some glitter on your hand, then shake hands with someone. Then they shake hands with someone else. Next thing you know, the 10th person down the line has glitter on her hands. Now, you’re not just talking about disease transmission, you’re seeing how it happens.

BIG TEETH.

Remember the dental hygienist who came to your elementary school? Remember those red tablets we chewed that stained the spots we didn’t brush? Well, that hygienist didn’t make it to the developing world. So we teach people on a larger-than-life set of teeth. We’re not sure what is so funny about brushing gigantic teeth, but people laugh and proper tooth brushing habits get seared into their memories.

DIARRHEA DOLL.

Nobody forgets their time with the diarrhea doll. She’s a great way to illustrate how dehydration kills and what can be done about it. Nearly everyone in the world has a cheap and easy solution in their kitchen. The doll opens the door for teaching people how to concoct their own oral rehydration solution with clean water, salt, and sugar. Everybody remembers the recipe because they get to keep the specially-made measuring spoon. In the hygiene world, where highly memorable is better than highly technical, a little diarrhea doll goes a long way towards saving lives.

TIPPY TAP.

When I was a missionary in the rural mountains of El Salvador, a physician came to our village and taught us all about washing our hands with soap. We listened attentively, but none of us started washing our hands—water was too scarce. Too bad we didn’t know how to make a tippy tap: a home-made hanging water-saving device (made from a plastic jug) complete with soap-on-a-rope. It’s ideal for handwashing when water is scarce.

WOMAN TO WOMAN, MOM TO MOM.

Perhaps most importantly, the health and hygiene course is about building relationships. Day one consists of knocking on doors and making friends. For many traditional people groups, a physician in a doctor’s office may as well be from another planet. But motherhood connects women across any cultural line. So when moms see their kids laughing and playing, engaged in

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games and crafts, they show up because they see that we care about their kids. It's important for the moms to be there; they have the biggest influence over household hygiene habits. It's important for the kids to learn the lessons the games teach; children more easily change their habits than adults, and are the most vulnerable to hygiene-related illness.

LADIES?

LWI strives to involve women in teaching health and hygiene. Women in the developing world have enough men telling them what to do; they tend to feel more at ease among other women. It's important that they feel comfortable learning these lessons, because there are more lives to be saved through good hygiene practices than through the most advanced medical technologies in the world. The most important things to teach are often the simplest—like handwashing with soap.



65,000,000,000 GERM-SPREADING FINGERS.

The Water Project is acutely aware of the need for hygiene training as a mortality reducer—there are, after all, 13 billion hands and 65 billion germ-spreading fingers in the world. We're constantly learning new ways to communicate these important lessons to the people we serve, and are excited to see the program expanding into new countries every year.

Teaching hygiene is also a chance to share our faith. Biblical truths are integrated into the course, and people experience our Lord who motivates us to serve others. The love he taught us 2,000 years ago might be the only eternal component in all our work. Our wells and tippy taps may not be here in a thousand years, but you can be sure that the love we share will be passed along.



Read more at thewaterproject.org

1. Lorna Fewtrell, Kaufmann R.B., Kay D., Enanoria W., Haller L., dan Colford J.M.C., Jr 2005. "Water, sanitation, and hygiene interventions to reduce diarrhea in less developed countries: A systematic review and meta analysis." *The Lancet Infectious Diseases*, Vol. 5, Issue 1:42-52. Also, Curtis, V. and Cairncross, S. 2003. "Effect of washing hands with soap on diarrhoea risk in the community: A systematic review." *The Lancet Infectious Diseases*, Vol.3, May 2003, pp 275-281. • 2. Lorna Fewtrell et al.

Top Left: While in Sierra Leone sanitation educator Lael Kucera used the diarrhea doll to demonstrate what dehydration does to the human body. **Top Right:** Sudanese women use a tippy tap to wash their hands. **Middle:** Severely malnourished twins in Sierra Leone were given a life-saving dose of a homemade oral rehydration solution. **Above:** Though hard to see, this Salvadoran boy's hands are covered with glitter, which represents germs.

A CLOSER LOOK:

WATER & EDUCATION

BY STAN PATYRAK



www.TheWaterProject.org

It's 8 a.m. Do you know where your kids are?

If your kids are between the ages of 5 and 17, chances are they're sitting in a classroom—unless your kids go to Lorenzo Gorvie Memorial Secondary School in Sierra Leone.

On a good day, 700 kids attend this school, which was built just after the civil war ended in 2002. Gabriel Jonathan Kamara started teaching that first year. Gabriel is not only a teacher—he also runs the health and sanitation program at the school. He and the other teachers here have a problem that is poison to any educational system.

They can't keep the kids in class.

It's not that these kids skip school or that they get sent home for misbehavior. "Since our pump spoiled, we have no water at all," Gabriel says. "All day the kids look out the window looking on the busy road. When they see a street vendor selling water, the kids run out to buy and beg for water. We can't get them to stay."

The kids get water from vendors in 100 or 300 ml plastic baggies, each with its own price. Gabriel fears the traffic on the road, but more than that, he fears the water the kids are buying.



ABOUT HALF OF AMERICAN SCHOOL KIDS WILL MISS 1-5 DAYS OF SCHOOL A YEAR.

IN THE DEVELOPING WORLD, WATER-RELATED DISEASES REDUCE SCHOOL ATTENDANCE OVERALL BY NEARLY 20 PERCENT.

DISEASE

This water is the other reason that the classrooms at Lorenzo Gorvie are never full. Diarrhea and typhoid take more kids out of school than any other cause. The kids don't know the source of the water they beg or buy. Based on the sickness he sees in the kids, Gabriel suspects the nearby river.

When this school had a working hand pump, every classroom had clean water. Without clean water, the school is losing students. Gabriel's school is not alone.

Children who suffer constant water-related diseases carry the disadvantages for the rest of their lives. Their poor health reduces cognitive potential and indirectly undermines schooling through attention deficits, absenteeism, and early drop-out. Water-related diseases cost an estimated 443 million school days each year.¹

SANITATION AND HYGIENE

Lorenzo Gorvie School's latrines were once adequate, although there are only five of them for 700 kids. "They stink," Gabriel says. He knows that simple maintenance would have kept them in much better shape, but explains, "We don't have water to wash the latrines." He's right. It turns out that the latrines began the decline into disrepair when the hand pump broke.

The deteriorating sanitation situation, caused by the absence of water, has had a devastating effect on the students—particularly the girls. Without proper sanitation facilities, the teachers of Lorenzo Gorvie have to send girls home when they menstruate. Gabriel shares that the girls are too shy to talk openly about their needs; when they complain about their stomachs, the teachers know to excuse them from class.

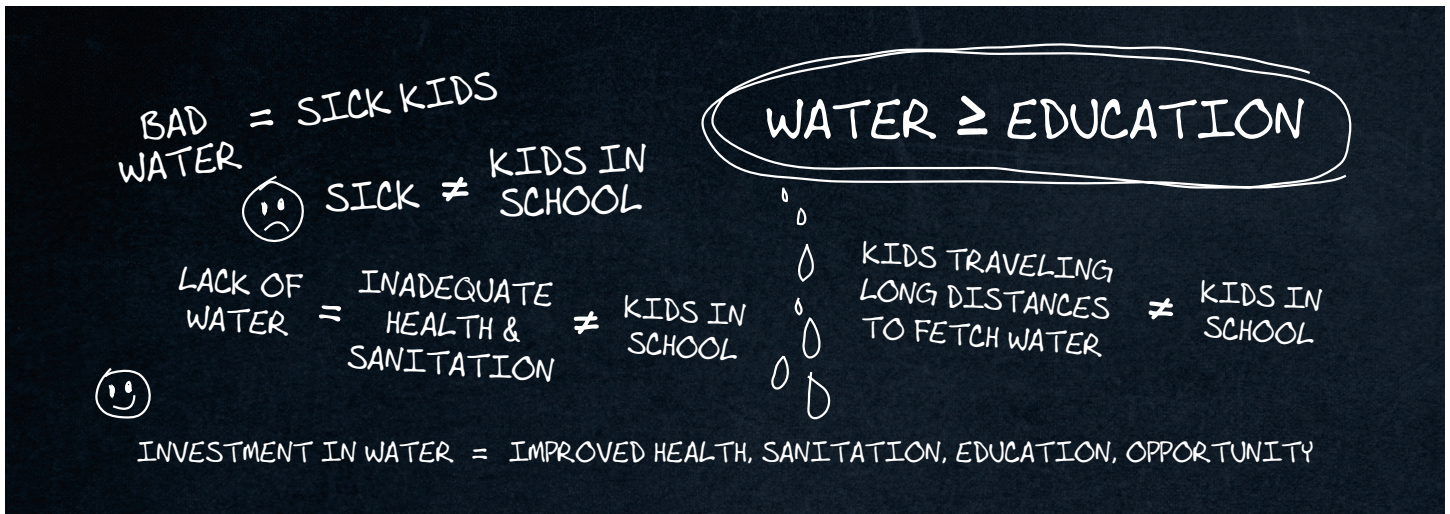
Lack of water and sanitation facilities also makes the recruitment of well-trained teachers difficult, which sometimes results in schools being closed for days or weeks at a time. The teachers who do accept posts in communities without water and sanitation face the same problems of water collection and disease as the pupils, and this affects the quality of their teaching and the amount of time they are able to dedicate to it.

Teachers know what they're up against. Gabriel, as the leader of Lorenzo Gorvie's health and sanitation program, understands more than most. UNICEF was recently in town to promote "Global Handwashing Day."

What on earth does a school without water do to promote hand-washing?

Gabriel explains: "We taught hand-washing—without water. The idea of hand-washing is... how do you say... an abstract thing without clean water."

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WALKING FOR WATER

It's not just illness that keeps kids out of school in the developing world. When households rely on water sources far from home, someone has to walk to collect it—a task that usually by necessity falls on the women and children of the family. Sometimes a water source is a hole in the ground, and that hole in the ground is half a day's walk away. This means that kids who could be in school spend their days collecting water.

Carrying heavy containers of water over long distances is not only physically stressful, but extremely time consuming. One of the most serious effects is that children do not have the time to attend school—they may not enroll at all, or they may be frequently absent.

In Tanzania, school attendance levels are 12 percent higher for girls in homes 15 minutes or less from a water source than for girls in homes an hour or more away. Attendance rates for boys are affected, too—but not as dramatically.²

WATER ≥ EDUCATION

It's not that water is more important than education—it's foundational. Try to convince teachers in the developing world otherwise.

Educational opportunities linked to water have lifelong impacts

across generations. Education empowers women to participate in decision-making in their communities. Educated adults are more likely to have smaller, healthier families; their own children are less likely to die and more likely to receive education.

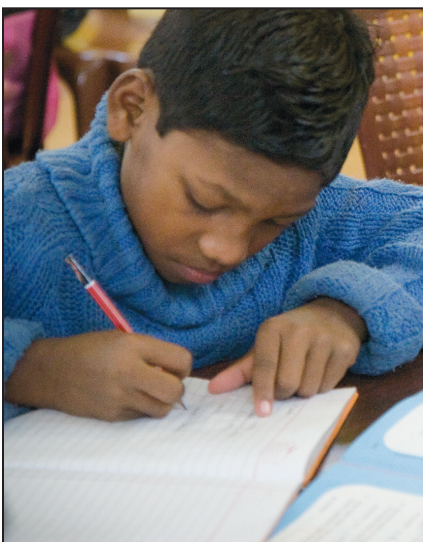
Just one additional year of schooling can earn individuals at least 10 percent higher wages. These earnings contribute to national economic growth. No country has ever achieved continuous and rapid growth without reaching an adult literacy rate of at least 40 percent.

With education, people are far better able to prevent disease and to use health services effectively. For instance, Africans who have completed primary education are half as likely to contract HIV as those who have little or no schooling.³ This alone is a staggering fact, considering that almost two-thirds of individuals with AIDS live in Africa.

Gabriel Kamara might say, "Without clean water, education is how do you say... an abstract thing."

1. UNDP Human Development Report 2006 – *Beyond Scarcity: Power, Poverty, and the Global Water Crisis*, p. 45. 2. *Ibid.*, p. 47. 3. "Education and the Developing World" – 2006, Center for Global Development, p. 1.

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Left: In India, an average of \$64 per year is spent per primary student in public education. In the U.S., it's about \$6,800. **Middle:** More than 150 million children in the developing world start school but do not complete four years; in Sub-Saharan Africa, only one in three who attend school complete a primary education.

Right: Gabriel Kamara stands proudly in front of the new handpump at Lorenzo Gorvie Memorial Secondary School.

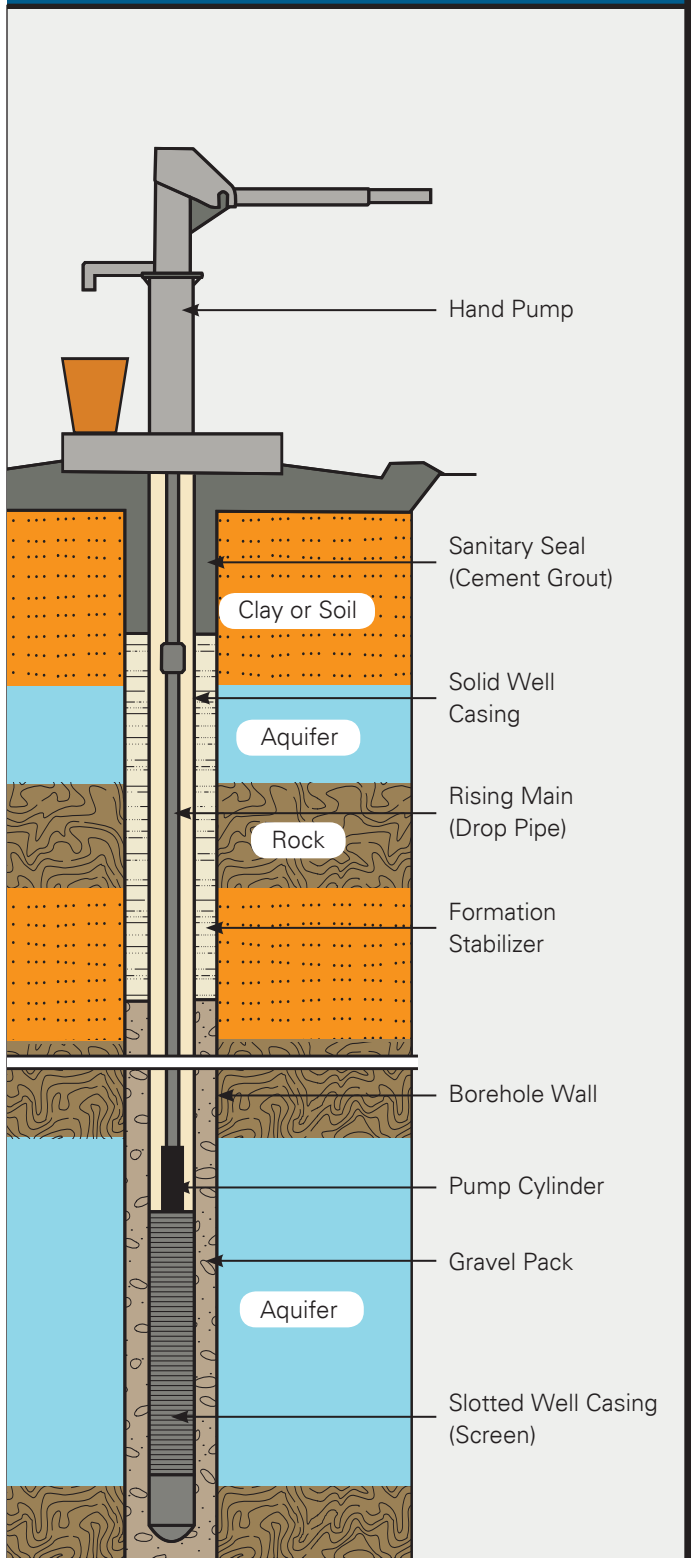
A CLOSER LOOK:

HOW WELLS WORK



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INSIDE A WELL



You know about the global water crisis. You've seen photos of kids drinking out of streams and mud holes—and you've seen them drinking water out of hand pumps after a new well is drilled in their village. But what does that shiny new pump mean for these kids and their community? Are wells like this really the best solution? How do they work? Are they sustainable? Are wells sucking up all the water? Are water wells a cookie-cutter solution that aid workers simply copy-and-paste from one community to another?

Read on. We'll try to answer your questions.

Wells aren't the only clean water solution; however, they're one of the most common. The vast majority of water projects undertaken by The Water Project are water wells—and for good reason: in most parts of the world, clean water can be found under your feet, in underground layers called aquifers. These layers are continually refilled by rain and other surface water that filters down through the earth. Water in aquifers is usually very clean; sand and porous rocks provide a natural purification system, filtering out sediment and bacteria.

SO WHAT'S A WELL?

A well is simply a hole in the ground that reaches down to an aquifer. Traditionally, people in the developing world have dug wells by hand, which means that only the shallowest aquifers can be reached; hand-dug wells rarely exceed 50 feet, and are often left open, allowing run-off water and other contaminants to enter the well from the surface. The shallow aquifers that these wells draw from are vulnerable to pollution from agricultural fertilizers, industrial waste, or seepage from nearby latrines.

With the right equipment, wells can be drilled to deeper, safer water. A pipe and a pump are used to pull water out of the ground, and a screen filters out any particles. Drilled wells are lined with PVC or galvanized steel to protect them from pollution that could otherwise seep in. They are sealed systems, with pumps that only allow water to flow out of the hole, to prevent contaminants from being introduced from the surface.

OKAY... HOW DOES IT WORK?

Wells come in different shapes and sizes, depending on the soil conditions and how much water is needed. In some areas, wells need to be very deep to reach good water—sometimes 1,500 feet or more—and require powerful electric pumps powered by diesel generators. These wells are drilled in large communities, and are often installed at a hospital or school. They can produce hundreds of thousands of gallons in a day and serve tens of thousands of people.

In the overwhelming majority of cases, wells don't need to be so deep; safe water is usually found within 100 feet of the surface. For a well like this, a manual hand pump can be installed. There are many kinds of hand pumps, some of which can pull

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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

HOLLYWOOD



water up from a depth of 200 feet. While not as convenient as an electric pump, a hand pump is usually a much more appropriate solution for a rural community, both culturally and technologically: hand pumps use common, easily-replaceable spare parts, and are simple for a village caretaker to maintain with minimal skills and few tools. Except for the occasional repair, it costs the community nothing to operate the well. Hand pumps are cost-effective, and the pumps used at TWP's wells are proven to be robust and reliable under field conditions. A single hand pump can easily provide water for a community of 500 people, but TWP teams regularly visit areas where two or three thousand people rely on one pump, and more wells are desperately needed.

Beyond the sustainability of the well, what about the water itself? News reports tell us that wells are pumping aquifers dry in India and parts of Africa. The thing to remember is that only a tiny percentage of water is used for human consumption. More than 70 percent of fresh water is used for agriculture and most of the rest for industry. Irrigation systems and factories operate on high-capacity water wells that run constantly, pulling millions of gallons daily. Water levels drop, sometimes causing shortage in surrounding residential areas. In contrast, the rate of flow on a village hand pump—about 5 gallons per minute—will never deplete a healthy aquifer. Using common sense in how we implement high-capacity drinking water projects and calling the industrial and agricultural sectors to be responsible water users will ensure plenty of

water for future generations.

HOW IS THE COMMUNITY INVOLVED?

When the time comes to decide on the appropriate solution in a particular village, the local community needs to lead the way. If a well is determined to be the best fix, the older members of the community are consulted on where the well should be placed; they often know where good wells were located generations before. In addition to finding the place most likely to produce good water, and placing it away from potential sources of contamination, the site of the well is important because the well is usually the social center of village life. If the well is not conveniently placed and conducive to social interaction, some people will continue to use their old watering holes. Many well-intentioned projects stand unused because a team of aid workers didn't bother to listen to the input of the intended beneficiaries.

At TWP, we are committed to being open to innovative techniques and technologies, but we are learning that the most innovative solution is collaborating with a community in a "low tech" but thoughtful answer. There's a lot of talk these days about creating "self-sustainability" as we approach community development projects. What if the answer isn't creating independence, but *interdependence*, as communities rely on one another to create and maintain the best solutions for the problems they face? What if, by starting by truly loving and listening to the people we came to serve, we could do something new—something that can serve a thirsty community for generations to come?

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