

By Patrick Tucker

Powered by Play

A Child-Run Water Pump

ROUNDOABOUT OUTDOOR

The child-powered water pump provides unlimited amusement to children in rural African villages while providing as much as 1,400 liters of fresh water an hour. Future play-powered pumps may also generate electricity.

The Play-Pump brings relief and enjoyment to communities in developing regions.

Nearly 200 million Africans are facing serious water shortages. That number will climb to 230 million by 2025, according to the United Nations Environment Program.

Getting fresh water to individuals, particularly in isolated areas, is a pressing dilemma. But inventor Trevor Field of the South African company Roundabout Outdoor is reducing the problem to a matter of child's play.

The Play-Pump is more than a merry-go-round. It's designed not only to amuse rambunctious kids, but also to pump desperately needed fresh water from depths of up to 100 meters.

Finding fresh water in many parts of Africa is a monumental task. Individuals (mostly women and children) are often forced to trek long distances to lakes, ponds, or public water pumps in other villages, and are able to bring back only about 25 liters (6.6 gallons) at a time. While the average human requires only about 4 liters of drinking water a day, as much as 5,000 liters of water is needed to produce a person's daily food requirements. The Play-Pumps, which are erected in school playgrounds, are able to produce 1,400 liters of water

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an hour, all while keeping children entertained.

"We've got 700 units in the ground right now," says Field. "We estimate those pumps help about 1,000 to 2,000 people. At a community about 40 miles north of Johannesburg, they had 500 children and no water supply to the school at all; they had no fresh water, no toilet, no water to wash their hands. Every drop they used they had to bring from kilometers away. We installed a Play-Pump there some years ago.

"The first thing we noticed was that girls started attending school more regularly, because girls reach a certain age where they have different hygiene concerns than boys," Field explains. "For instance, girls would not attend school during the week of their menstrual cycle. This resulted in a gender inequality issue in terms of education. We fixed that straight away. We cut down on school absenteeism for teachers, too. The water is cleaner so the people that use it have fewer stomach upsets.

"Those were just the benefits that were obvious immediately," says Field. "The children [at that school] now have got a vegetable garden going, so they've got added protein and nutritional value in their diet. The main thing is the impact on children's education, in addition to their health. When you have to carry water two kilometers a day, and wait in long lines to use a water pump, you miss out on a lot of education."

According to Field, the pumps are very popular with the children. "The kids really enjoy it. A lot of schools in Africa have limited access to books, much less playground equipment. To combine equipment with water extraction is to kill two birds with one stone," he says.

The device is what Field calls a positive displacement pump. As the children spin around, the pump's two working parts transfer their energy into vertical or reciprocal motion, and that pushes water from an underground borehole or well to the surface. This unique design is what allows the mechanism to tap into an entirely novel power source—the power of play.

"With a regular water pump, only one person can operate it at a time, but 20 kids can use a roundabout. I began to realize we had a real untapped energy source in children. Children are naturally exuberant; we all sit around and look at children and think, 'Where do they get the energy?' Once you figure out how to combine something that's fun with a system that has a benefit, you never forget," Field says.

The next generation of Play-Pumps will reach communities in even more isolated areas and bring water up from ever-deeper depths. "At Johannesburg University, they are working on two of our prototypes," says Field. "These [new] pumps will not only pump water but will also create electricity. Once that happens, companies will be able to



"Roundabout" way to pump water turns the power of children's play into energy.

put up cell-phone towers, lighting, etc., in the middle of the Sahara Desert. With the current pumps, we are limited in the mechanical aspect in terms of how much we can lift. Extracting water from below 100 meters is very difficult, so we have to abandon certain wells that are too deep. But with an electrical pump we can go 200 meters down, so it will open up that much more ground water availability."

Field calls the pumps a joint-win situation: "Children enjoy riding on it; villagers no longer have to walk hours to the nearest well. I think we can change the world." □

About the Author

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