

many hands for water

By Mike Dowse

The signature on Chad Bissonnette's e-mail account ends with five words written in Creole: "Men anpil, chay pa lou." These make up an old Haitian proverb that means "many hands make the load lighter," speaking to the importance of communal strength based on effective communication and mutual respect. Little did Bissonnette know how much legwork would be needed to make the proverb a reality for a small community in its Caribbean island nation.

Electronic diaphragm metering pump finalizes Haitian clean water project

Bissonnette is the executive director and co-founder of Roots of Development, a nonprofit organization based in Washington, D.C., with the mission of helping Haiti's impoverished communities obtain the resources they need to sustainably manage their own development, with an emphasis placed on alternative, grassroots and community-driven approaches to rural development. The seeds of Roots of Development were planted five years ago when Bissonnette—then a college student at American University in Washington, D.C.—signed up for an alternative spring break program that involved a trip to Haiti.

Haiti is a country of roughly 9 million residents that occupies the western half of the island of Hispaniola, which it shares with the Dominican Republic. According to the Human Development Index, Haiti is the poorest country in the Western Hemisphere, with 80% of its population estimated to be living in poverty. The state of the island and its people, as well as their never-say-die attitude, left a deep impression on Bissonnette. When he graduated from American University, he made a return trip to Haiti to learn more about the culture, the people and the challenges they face on a daily basis.

On his second trip to La Gonave, an island approximately 50 miles from the capital Port-au-Prince, Bissonnette decided that he had to do something to help the residents of Gran Sous improve their daily lives. He met with members of a local community development group, the Association of Community Organisers and Peasants of La Gonave (AAPLAG), to share his decision. Working collectively with community residents and members of AAPLAG, it was determined that the most pressing need of the residents of Gran Sous was access to clean, treated water. Upon his return, Bissonnette began to formalize an outreach and fund-raising plan that would result in clean water becoming available to all members of the community.

Gran Sous Water Rehabilitation Project

The residents of Gran Sous and the surrounding area would gather the water they needed from

an aboveground freshwater spring. While the spring, which is the largest on the island of La Gonave, offered a never-ending supply of water, the water it produced was not scientifically fit for human consumption: It contained extremely elevated levels of fecal coliform, total coliform, nitrates, nitrites and alkalinity.

But when this is the only source available for bathing, drinking, cooking and cleaning, there is not much choice but for residents to use and consume the water while risking illness and disease. Taking note of the terrain and the needs of the community, Roots of Development helped conceive a plan that required an 18,000-liter cistern to be built in Gran Sous that would gather a portion of the spring's water and distribute it for villagers' use (the remaining portion of the spring water would be left to flow freely for livestock use and agricultural purposes).

A series of pipes stretching 250 ft would divert the water from the spring to the cistern, where it would be treated with sodium hypochlorite. A series of faucets would be installed at the base of the cistern so that residents could come to draw water as they needed it. Treated water also would be directed to three other areas: a men's bathing area, a women's bathing area and an area to be used for washing clothes.

With community members and AAPLAG on board—and the bulk of the funds needed for the project raised through donations—construction began in 2007. With the help of three volunteer engineers from Ecuador who were flown in for the more complicated aspects of the project, the work was completed in 2008. When the water began flowing through the cistern, tests showed that contaminant levels had been reduced to zero, meaning that for the first time in the community's history its residents were drinking clean, treated, healthy water.

Finishing Touch

There was one hiccup in the operation: The technology being used to deliver the sodium hypochlorite to the water was inefficient and prone to malfunction. "It was very difficult to find the right kind of



A member of the Gran Sous community on Haiti's La Gonave Island checks on the operation of the new pump.



A young boy fills his gallon jug with freshly treated water from the cistern at the Gran Sous Water Rehabilitation Project. (Photo courtesy of Braden Summers.)

rolling with the punches

Weeks after the Gran Sous Water Rehabilitation Project on the island of La Gonave was completed in 2008, Haiti was inundated by a series of four hurricanes, destroying entire communities and leaving thousands homeless. Again, Roots of Development stepped into the breach and, working with island volunteers, rebuilt several houses—all designed to withstand future hurricanes.

Hurricanes, however, were the least of Haiti's problems on Jan. 12, 2010, when a 7.0-magnitude earthquake centered near the capital of Port-Au-Prince rocked the country. The earthquake affected an estimated 3 million of the country's 9 million residents. Government figures put the number killed at more than 230,000, and 1 million have been left homeless. Earthquake damage in Gran Sous on the island of La Gonave was minimal, but the effects were felt nonetheless.

"There was a little structural damage in the area, but the biggest consequence in that community was the extraordinary amount of people that came from the city in droves," Bissonnette said. "Supplies were cut off from the mainland and food and construction materials were not coming to the island, so hunger became a serious issue quickly."

If there was one silver lining, it was that the houses constructed following the 2008 hurricanes emerged unscathed. "Not a single home had a crack in it," Bissonnette said. There was also no damage or interruption in the water-sanitizing operations at the Gran Sous Water Rehabilitation Project, which allowed refugees from the earthquake access to fresh, clean, treated water.

device to do what we were looking for," Bissonnette said. "First, we were using an intravenous drip like you'd see in a hospital, but that was very unreliable and not designed to do high-quality treatment of an 18,000-liter tank. Then we tried a device that works with two containers. We'd mix the concentrate in one container, then have it drip into the second container through a thin rubber hose, but it was very difficult to control the flow at the rate that we wanted."

In the search for a solution, Bissonnette called on the expertise of friend and colleague Geoffrey Kurgan, an engineer who works for The World Bank. Kurgan visited the site and determined that the best solution would be to use a metering pump to introduce the sodium hypochlorite to the water supply at a regulated flow rate. In researching the type of pump that could do the job, Kurgan came across Neptune Chemical Pump Co., Lansdale, Pa.

"The people from Roots of Development called Neptune, and Neptune passed it along to me as their representative," said David Kershner, director of after-market sales for Kershner Environmental Technologies LLC (KET), Reisterstown, Md. "They had a ton of questions for me about the technology—about the pumps, how to do it, how to figure out the dosages. I gave them a rundown of the different pumps out there and told them why a Neptune pump was a good pump and the best choice for their operation."

What Kershner recommended was a Neptune PZ Series electronic diaphragm metering pump, ideal for the Gran Sous project because its "pulse" metering design operates on any single-phase voltage from 94 VAC to 264 VAC, which is a crucial because the pump would be operating on solar-powered batteries. The pump's manual stroke-length adjustment ranges from 50% to 100% with proportional control, cycle and counter functions built into the unit. Furthermore, it is ideal for general chemical applications, which fit the bill for the Gran Sous operation. KET sold the pump to Roots of Development at a discounted price and donated a spare parts kit that could be kept on hand in case maintenance was required.

Armed with the new pump, Bissonnette returned to Gran Sous in the summer of 2010, intent on delivering it to the project's sodium hypochlorite-metering conundrum. To say that the results have exceeded expectations would be an understatement.

"We had been looking for a solution for a year and a half, and the [new] device has been perfect," Bissonnette said. "It's been in operation for a few months, and we can rely on it, which is what our biggest concern was. It was very easy to install, very easy to use for the man who is in charge of monitoring the project. It's doing exactly what we needed it to do, which is inject the chemical solution at the same rate that the water flows into the tank. It has produced a lot of confidence in the community members responsible for managing the facility and treating the water."

Joint Effort Pays Off

Many different hands have helped lighten the load for the residents of Gran Sous—from those that were on the ground in Haiti during the construction of the cistern to those that reached into their wallets and donated the much-needed funds. In fact, the Gran Sous Water Rehabilitation Project, thanks to the efforts of hundreds of people, has been such a success that Bissonnette foresees an eventual series of water projects springing from this effort.

"More and more people are traveling from farther and farther away to get to the water, so neighboring communities are asking us to help them with their water resources," said Bissonnette, who noted that the 18,000-liter storage cistern now needs to be refilled every two days. "We have already done some preliminary planning for a water project in the community of Nan Plim." [www](#)

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