Greg Allgood must have seemed like a traveling magician to the woman in the rural village in Kenya he visited in 2001. He had arrived to demonstrate the remarkable action of a small foil packet.

Allgood emptied the powdery contents of the 4-ounce packet into a jug of murky water. He stirred the solution for five minutes and then let it sit for another five while its dark contaminants settled at the bottom of the container. After 20 more minutes, the water was so crystal clear that the woman and her children could drink it. The woman was elated. She had never enjoyed pure drinking water before.

Allgood’s demonstration wasn’t magic. It was pure science. Since that trip to Kenya, Allgood has traveled the developing world, demonstrating and dispensing the amazing little packets. “There’s nothing more rewarding than giving children their first glass of clean, purified drinking water,” he says.

"FLOCKING" TOGETHER
Allgood (pictured at far right) is a toxicologist at Procter & Gamble (P&G) in Cincinnati. A toxicologist studies the effects of poisons on plant and animal life. Since 2004, Allgood has also been director of the company’s Children’s Safe Drinking Water program.

The small packages that Allgood dispenses are called PUR Purifier of Water packets. Two of his P&G colleagues in Great Britain, Phil Souter and Colin Ure, invented them. PUR packets contain flocculants (FLASH-kyoo-lehntss), chemical agents that make impurities flocculate, or clump together. The impurities flocculate into larger and larger particles until they become so heavy that they settle to the bottom of their container, where they can be easily removed. If your home has a swimming pool, flocculants are probably used to remove debris from it.
Waterborne diseases have been called the “silent tsunami,” says Malcolm Morris, chair of Millennium Water Alliance, a group of organizations whose mission is to help people in developing nations obtain clean water. “There are many competing needs that [world] leaders are faced with,” says Morris. “However, if no provision is made first for clean water, I predict that no country will ever rise out of its poverty.”

PUR is manufactured in Pakistan and sold to humanitarian groups at 3.5 cents a packet. So far, PUR is available in about 40 developing countries. Allgood says P&G plans to be producing enough PUR packets by this summer to provide up to 1.5 billion liters (396 million gallons) of purified water per year.

**CHANGED LIVES**

After the woman watched Allgood purify the jug of dirty water that day in 2001, her feelings of joy were cut short. “The water was so valuable that someone stole it,” says Allgood. “She begged us for our remaining packets, and we gave them to her. This showed me the amazing potential of this product to change lives.”

“I’ve visited with thousands of children in hospitals, orphanages, schools, and their homes, and seen firsthand the difference that we’re making in their lives with the PUR packets,” says Allgood. “Children no longer die needlessly from cholera, dysentery, and typhoid fever.”

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**Packaged Ingredients**

How does PUR purify? Each packet holds these ingredients:

- iron, in the form of iron sulfate (FeSO₄). It is the flocculant in PUR and removes heavy metals.
- clay. It speeds the formation of flocs (clumps of impurities).
- sodium citrate (Na₂C₆H₅O₇): It brings water to a neutral pH, an indicator of the acidity or alkalinity of a solution. On a scale of 0 to 14; a pH rating lower than 7 indicates the water is acidic and a pH higher than 7 indicates that the water is alkaline. A neutral pH of 7 promotes the formation of flocs.
- calcium hypochlorite (Ca(OCl)₂): It is a disinfectant, a substance that kills bacteria and viruses.