

# The Better Water Maker



**B9 Plastics, Inc.**

Sustainable Prosperity Through Technology

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## A Concept Paper

### PROBLEM STATEMENT:

According to the World Health Organization, 3.4 million people, mostly children, die annually from water-related diseases, and even greater numbers are hospitalized. Most of these illnesses and deaths can be prevented through access to safe drinking water. More than 1 billion people draw their water from unsafe sources, exposing them to diseases such as diarrhea, dysentery, cholera, typhoid, and many others. Over 80 percent of these people live in rural areas where water and sanitation infrastructure is nonexistent. But even in urban and periurban areas of the developing world, water systems frequently fail on basic microbiological quality. Providing access to potable water for more than 1 billion people globally cannot be done overnight. It is estimated that it would cost \$23 billion per year to achieve the UN Millennium Development Goal, of cutting in half the number of people without access to potable water, by 2015.

Waiting for “big solutions” while ignoring the immediate needs of the most vulnerable makes no sense. There are small-scale, simple, inexpensive measures and intermediate actions which can be taken to great effect. This concept paper presents one such action for your consideration.

### THE IDEA:

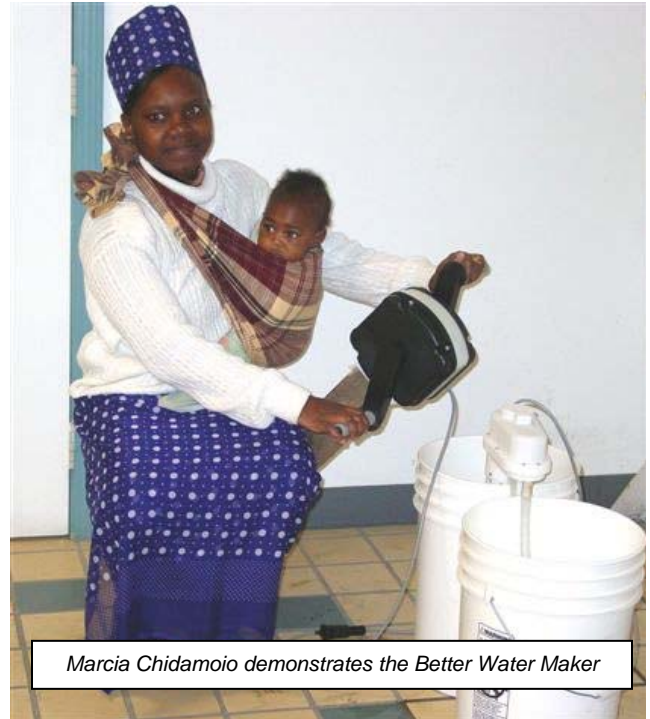
A device designed for use in the developing world has been invented that kills water microbes by using ultraviolet light. We call it the Better Water Maker (BWM). By physically turning a crank, 12 volt electric power can be generated to pump water through a column containing an ultraviolet light bulb. The water flow is controlled to make sure there is enough contact with the UV light to kill E.coli bacteria. The device does not allow water to flow unless it has had the proper UV light treatment. Other electronic devices that run on 12 volt DC electricity can be connected to the power generating unit as well –lights, cell phone chargers, and radios. The lightweight durable plastic units are easily movable and can be used by numerous families.

### INNOVATION:

The primary water treatments currently being used in the developing world are chlorination, solar disinfection, and sand filtration. Chlorination is a proven means of ridding water of disease causing micro-organisms in piped water supply, but the prevailing wisdom is that chlorinated water should be dealt with after basic water supply and sanitation are in place. Solar water treatment is a simple, nearly cost-free method which uses the sun, throw-away plastic soft-drink bottles and a black surface.

However, the technique requires substantial time, and such devices are unusable at night, and during monsoon and flood situations – precisely when potable water is most scarce. Sand filters are effective but they are not easily moved and require regular additives and maintenance.

Unlike chemical water treatments, the BWM can safely produce as much or little water as needed. Unlike solar devices, the BWM can produce potable water immediately, anytime and anywhere. Unlike sand filtration systems, the BWM is very portable and needs no ongoing perishables, parts or chemicals except for



*Marcia Chidamoio demonstrates the Better Water Maker*

replacing a UV bulb after 8,000 hours of operation which equals about 225,000 gallons. Use of the Better Water Maker is environmentally benign; the source of energy is human power and there are no waste products. The BWM is the brainchild of a plastics manufacturer who is pioneering the industrial use of alternative energy and sustainable manufacturing. His company has spent seven years developing the device to be appropriate for African and other third world cultures.

#### **IMPLEMENTATION:**

There are many existing organizations that focus on providing safe drinking water to people in developing countries. Our goal is to provide them with an improved tool for accomplishing their work. B9 Plastics, Inc. and Harbec Plastics, Inc. have completely funded the development of the BWM to this point. They have been able to place two field test units in Africa, a third unit is scheduled to go to India shortly and a fourth is destined for Tanzania. The University of Rochester has provided our water testing and they recently certified that the device 'affectively inactivates most of the contaminating MS2 bacteriophage in water'.

#### **OUTCOMES:**

Potable drinking water will result in many fewer illnesses and deaths. Access to small amounts of onsite-generated electricity will allow people to use small appliances to improve their quality of life. Since a single unit can be used by numerous families, one hundred units will benefit upwards of 1000 people. They will enjoy better health and an improved quality of life. The medical community will also benefit by an easing of their work load. The Better Water Maker is a 'point of use', household water treatment system. Most leading experts are now promoting these concepts as the best potentials for making significant improvements in the developing world water problem.

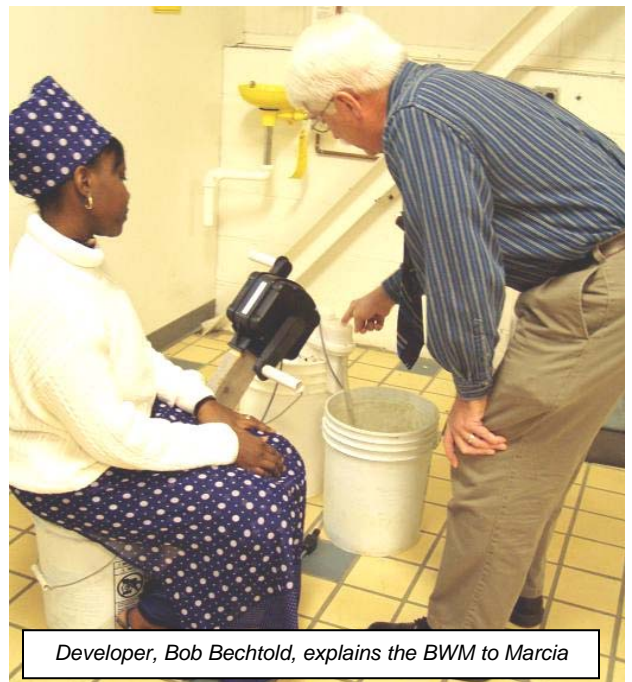
#### **FINANCIAL VIABILITY:**

At full production, the price of the BWM will be less than \$US 100. The manufacturer's commitment to this price is already in hand. Once the design has been perfected, millions of Better Water Makers can be manufactured on demand using standard plastic injection molding techniques and common electrical components. The cost of production tooling for going into full-scale production is \$500,000 for the injection molds. Additionally, there will be costs of materials, shipping, and maintaining supply lines for minimal parts.

Once the initial costs are covered – which we expect to secure with the help of NGOs like IHSAN (Industry's Humanitarian Support Alliance) or similar groups – Rotary International is committed to buying units at \$100 apiece and shipping them abroad. Project partners will explore purchase, rent, lease-to-buy, and government subsidy options as well.

#### **REPLICABILITY, SUSTAINABILITY AND SCALING UP:**

There is no reason why the Better Water Maker could not be used anywhere in the world where predictably safe drinking water is in short supply. Expanded distribution of the units will depend on building appropriate local partnerships, finding cost-effective means of shipping, navigating import tariffs, identifying the appropriate distribution/education points, and determining the financials. Setting up and maintaining supply lines will also need to be well planned. In the relatively near term, local people might be trained to assemble the units and in the long-term manufacturing plants could be built in Africa and other developing nations. Plastics manufacturing could be an opportunity for any developing country.



*Developer, Bob Bechtold, explains the BWM to Marcia*