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# **BUILDING A VIABLE COMMERCIAL MARKET FOR HOUSEHOLD WATER TREATMENT PRODUCTS AT THE BASE OF THE PYRAMID**



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This publication was produced for review by the United States Agency for International Development. It was prepared by Françoise Armand, Abt Associates Inc., for the Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment (POUZN) project.





## **POUZN Technical Report No. 5**

The mission of the Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment (POUZN) Project is to mobilize the private sector for the prevention and treatment of diarrhea through the introduction of low-cost point-of-use (POU) water treatment products and zinc, thereby contributing to the reduction of mortality and morbidity from diarrhea.

**POUZN Research Report Series:** POUZN's research report series addresses important issues of childhood diarrhea prevention and treatment focusing on point-of-use water disinfection and zinc treatment. The papers are disseminated to a broad audience, including donor agency representatives, commercial and private sector partners, policy makers, technical advisors and researchers. POUZN staff and external reviewers review all papers.

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## **DISCLAIMER**

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# ABSTRACT

Appropriate water disinfection at the household level can improve microbial water quality and significantly reduce diarrheal episodes, yet achieving sustainable national scale up of household water treatment (HWT) programs and changing behaviors of the targeted populations who do not have access to safe water have proven to be a challenge. This report describes the context in which HWT products are being commercially introduced to low-income markets and provides an overview of four documented experiences in marketing commercial HWT products to populations living on \$2–5 per day: Procter and Gamble’s PUR Purifier of Water, Indonesia’s Air Rahmat, Medentech’s Aquatabs, and three commercial manufacturers of water filters in India. The report discusses the marketing and behavioral challenges faced by companies manufacturing and marketing HWT technologies as well as opportunities for positioning HWT products among low-income consumers. Commercial manufacturers cannot afford to invest large sums in public education, behavior change programs, or dedicated distribution channels. Thus, public/private partnership approaches can be appropriate strategies for both allowing the commercial sector to invest in market-building activities and take advantage of its own strengths and refocusing donor and public sector resources on demand creation activities that would not only increase the health impact of water treatment interventions, but also create markets for private suppliers of water treatment products.



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# ACRONYMS

<b>AED</b>	Academy for Educational Development
<b>BOP</b>	Base of the Pyramid
<b>CDC</b>	U.S. Centers for Disease Control and Prevention
<b>CSR</b>	Corporate Social Responsibility
<b>DI</b>	Diffusion of Innovations
<b>DHS</b>	Demographic and Health Survey
<b>FMCG</b>	Fast Moving Consumer Goods
<b>HUL</b>	Hindustan Unilever
<b>HWT</b>	Household Water Treatment
<b>IFC</b>	International Finance Corporation
<b>ITN</b>	Insecticide treated bednets
<b>JHU-CCP</b>	Johns Hopkins University–Center for Communication Programs
<b>MOH</b>	Ministry of Health
<b>NaDCC</b>	Sodium Dichloroisocyanurate
<b>NGO</b>	Nongovernmental Organization
<b>P&amp;G</b>	Procter & Gamble
<b>PATH</b>	Program for Applied Technologies in Health
<b>PPP</b>	Public/Private Partnership
<b>PSI</b>	Population Services International
<b>POU</b>	Point of Use
<b>POUZN</b>	Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment Project
<b>R&amp;D</b>	Research and Development
<b>SDWA</b>	Safe Drinking Water Alliance
<b>SWS</b>	Safe Water System
<b>USAID</b>	United States Agency for International Development
<b>WHO</b>	World Health Organization



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# I. INTRODUCTION

Research has shown that appropriate water treatment at the point of use (POU), applied in conjunction with safe storage, can improve microbial water quality and significantly reduce diarrhea, a major cause of child mortality (WHO 2007). In 2001, a WHO study identified a number of promising and accessible POU methods ranging from chlorination with safe storage to various types of household filters (Sobsey 2002). Since the publication of the study, over 100 governmental, nonprofit, academic and private sector organizations have joined the Network to Promote Household Water Treatment and Safe Storage in a concerted effort to increase access to safe water in the developing world.

Achieving high health impact, saving the maximum number of lives, requires scaling up programs, reaching those most at risk, and achieving sustained behavior change at the household and community levels. With two billion gastrointestinal infections and 1.5 million preventable child deaths occurring each year from illnesses that could largely be averted with improved sanitation and safe drinking water, POU treatment products have a powerful role to play in reducing adult and child mortality throughout the world. Reaching the Base of the Pyramid (BOP), defined as the 4 billion people living on less than \$2 per day (Prahalad 2004), with POU products and messages is critical to reducing the risk of diarrheal disease or death from drinking contaminated water, as people living at the BOP are more likely to have the highest unmet need for affordable water treatment product (WHO 2010).

Although scaling up household water treatment (HWT) programs to achieve high health impact is the main objective of the safe water community, doing so in a sustainable manner is also critical, as donor funding is limited and achieving scale will require increasing amounts of donor funding. To be sustained, a scaled-up intervention is likely to require cost-effective supply chains, a critical mass of regular users, and high levels of cost recovery. Partnering with private sector suppliers of HWT products that have commercial viability as their primary goal may help build more sustainable programs, and direct donor resources where they are most needed. HWT interventions may also benefit from the resources and experience of companies that have built their success on their ability to understand and meet the needs of consumers. This report describes the context in which HWT products are being introduced to the low-income market, provides an overview of four documented experiences in marketing commercial HWT products to populations at the BOP, discusses related marketing and behavioral challenges faced by companies manufacturing and marketing HWT technologies as they attempt to establish a viable position in the marketplace, presents possible public/private partnership (PPP) approaches to address these issues, and draws lessons for future programs.



## 2. THE CONTEXT

The availability of POU products in developing countries has increased significantly since the late 1990s. Chlorination, mainly using a dilute solution of bleach (sodium hypochlorite) manufactured to food grade standards, is credited with the highest level of coverage to date of a POU method other than boiling (Clasen 2009). Chlorination is a key component of the Safe Water System (SWS), designed by the U.S. Centers for Disease Control and Prevention (CDC), which also includes safe water storage in an appropriate container and behavior change promotion. The chlorine solution, generally marketed as WaterGuard in anglophone countries and as Sûr'Eau in francophone countries, has been introduced by social marketing-focused nongovernmental organizations (NGOs) such as Population Services International (PSI) in over 20 countries, and has achieved national distribution coverage in Kenya, Madagascar, and Zambia. Aquatabs, an effervescent tablet using sodium dichloroisocyanurate (NaDCC) as the active ingredient, manufactured by Medentech in Ireland, has also been made available through social marketing and commercial channels in 28 countries. In addition, USAID and the Bill and Melinda Gates Foundation have supported programs to increase access to household water filters through partnerships with manufacturers, NGOs, and microfinance institutions in India and other southeast Asian countries. Most donor-funded POU programs, however, have had difficulty achieving scale, demonstrating health impact, and sustaining the cost of demand creation programs. POU programs indeed face persistent and unique challenges, such as the belief that diarrhea is not a disease, low acceptability of available products, imperfect delivery strategies, scarce public resources, and perceived conflict with efforts to promote piped-in water supplies (Clasen 2009).

### 2.1 CHALLENGES IN SCALING UP POU PROGRAMS

#### **Demonstrating public health impact at scale**

Many trials have shown the effectiveness of POU (particularly the use of chlorine) in reducing the incidence of diarrhea, but most have been small and short in duration (Arnold and Colford 2007). To date, few POU programs have achieved high population coverage (Luby 2007, Arnold et al. 2009, Trivedi et al. 2009) and programs that reached national scale distribution have reported modest uptake (Olembo et al. 2004). Slow progress is not unusual for programs involving the adoption of unknown products or new behaviors, but POU has met with skepticism from some researchers in the safe water community (Schmidt and Cairncross 2009).

#### **Influence of socio-demographics**

Regular users of water treatment products are most likely to be from urban and peri-urban settings, more educated, and living in better houses – those at least risk of consuming contaminated drinking water (Olembo et al. 2004, Rheingans and Dreibelbis 2007, PATH 2009a). Adoption in rural communities faces the most barriers, such as limited income, a history of receiving free goods from NGOs, and entrenched water-related practices (Makutsa et al. 2001). Donor-funded programs typically focus on poor communities at high risk for diarrheal disease from contaminated drinking water, but very low propensity to treat their water outside of emergencies. As a result, they face significant barriers in achieving correct, consistent, and sustained adoption.

## **Perceptions of risk and seasonality**

Both research and lessons from field programs suggest that people are more likely to treat their water when they have a perceived need for water treatment to prevent diarrhea (Makutsa et al. 2001, Jalan and Somanathan 2008, Heri and Mosler 2008), or live with a sick family member (SDWA 2010). In Uttar Pradesh, the Academy for Educational Development (AED) found that slum dwellers, who have a more accurate perception of the quality of their water than rural populations, were most likely to adopt POU products. Using “before and after” test kits to demonstrate the presence of contaminants in water has reportedly resulted in noticeable increases in the adoption of POU (Saadé et al. 2009). Risk perception, however, tends to be related to wealth and education; in Andhra Pradesh, people in high-income groups were more aware of the quality of their water, and of the link between water quality and diarrhea than other groups (PATH 2009a). Mass promotion of POU products appears to have had limited success in changing water-related behaviors, possibly because increasing perceptions of risk requires substantial education and trusted sources (PSI 2009, Chankova 2009).

The treatment of household water tends to peak before and during a country’s diarrhea season, and fall substantially afterward. A study conducted by PSI/Kenya indicated that one-third of self-reported “inconsistent users” only treated their water during the rainy season (POUZN 2007). Outbreaks of cholera and other epidemics can also dramatically increase the use of treatment products. While emergencies may undermine efforts to establish consistent POU behaviors, they can also work to the advantage of social marketing and commercial product suppliers: After a massive cholera epidemic drove up demand for POU products in Madagascar, PSI increased the distribution of its Sûr’Eau brand to national scale in less than a year (Dunston et al. 2001). Similarly, a field trial of PSI’s socially marketed CLORIN in Zambia quickly reached high use rates after a severe cholera outbreak (Olembo et al. 2004).

## **Sustainability challenges**

Selling POU products through commercial or community-based distribution channels can help increase the availability of products and improve the financial sustainability of the program through cost recovery. Programs that serve vulnerable populations, however, tend to prioritize immediate or short-term health impact over the medium- and longer-term sustainability of the program. Because high prices, weak supply chains, and lack of awareness are the most obvious barriers to adoption, many NGO-based programs focus on price subsidies, direct sales programs, and mass media campaigns. As they begin to scale up, however, these programs often struggle with sustainability issues.

To achieve financial sustainability, programs must absorb the costs of producing, distributing, and promoting POU products through sales revenue. In order to become completely self-sufficient, they should also recover a portion of fixed costs, such as warehousing, transportation, distribution, and overhead. This is not a realistic goal in the first few years of implementation of POU programs, but partial cost recovery can prevent the widening sustainability gap resulting from needed subsidies. Despite the fact that sodium hypochlorite solution and NaDCC tablets are produced very cheaply (POUZN 2007), many POU donor-funded programs are reluctant to sell products at cost-recovery prices for fear of negatively affecting adoption rates. PSI for example found that POU consumers were extremely price sensitive. Demand for POU dropped dramatically when the POU product cost exceeded 1 percent of annual income. Another study conducted in 2004, found that only wealthy households were willing to spend up to 1 percent of their household income on POU products. Among the poor, demand for POU dropped when expenditures approached 0.3 percent to 0.4 percent of income (Harris 2005). Distributing donated products or selling them below replacement costs, therefore, inevitably requires increased donor funding as programs expand.

## 2.2 COMMERCIAL APPROACHES TO POU

Building a sustainable market for water treatment products may not be achievable for programs operating in very low-resource communities. According to a 2009 report by the International Finance Corporation (IFC), a large proportion of the 4 billion people in need of safe water are unlikely to contribute to a cost-effective scale-up of safe water technologies and business models. The report contends that the private sector should be encouraged to develop market-based safe water solutions, allowing governments and NGOs to focus their resources on populations that cannot be reached through commercial strategies (IFC 2009). The arbitrary division between individuals who must rely on public services, and those who can purchase what they need, however, has been challenged by advocates of a greater involvement by the business community in development issues (Hart 2007, London and Hart 2007, United Nations Development Program [UNDP] 2008, Yunus 2008). In the years since the publication of *The Fortune at the Bottom of the Pyramid* (Prahalad 2004), there has been growing interest in business models for reaching low-income and rural consumers (World Business Council for Sustainable Development 2004, Mahajan and Banga 2005, Bornstein and Davis 2010).

While the term BOP commonly refers to people living in the developing world whose annual per capita incomes fall below US\$2 per day, this figure fails to distinguish people living in deep poverty who can barely afford basic necessities from those who have enough income to consume and trade in goods and services. According to a 2007 Harvard Business School publication (Rangan et al. 2007), the business community should focus on a “submerged market” that includes individuals with incomes between US\$1 and US\$5 per day. This market segment is described as “inefficient” because it lacks the infrastructure and supporting financial institutions that allow the rest of the pyramid to thrive. A 2008 PATH report concluded that commercial manufacturers of POU products are best positioned to serve the submerged market, while the remaining 1.2 billion people living on less than US\$1 a day should look to the nonprofit and public sector for free or subsidized products (PATH 2008).

A recent study by the Monitor Group identified high education and start-up costs, low access to credit, low staff retention, and weak value chains as significant barriers that typically prevent purely social enterprises from becoming commercially viable (Karamchandani et al. 2009). A pressing question is whether for-profit solutions to public health challenges can achieve both commercial viability and health impact, and in what time frame. There is some consensus that the private sector as a whole has a key role to play in ensuring efficient and sustainable provision of POU products (Hammond et al. 2007, IFC 2009), but some authors argue that many market-based programs have been either unsustainable, ineffective, or both (Harris 2005, Heierli 2008). Heierli in particular argues that neither the private nor the public sectors alone can achieve anything at the required scale for safe water, and pleads for a strategic approach combining social marketing “to change habits” and marketing “to make affordable solutions available.”

The following examples illustrate the opportunities and challenges faced by manufacturers of chlorine-based products and household filters in marketing their products for consumers at the BOP.



# 3. MARKETING POU PRODUCTS FOR A PROFIT

## 3.1 PUR, PURIFIER OF WATER

The case of PUR, Purifier of Water, a household water treatment product launched in 2002 by Procter & Gamble (P&G), has been widely documented (Ellison and Bellman 2005, Harris 2005, Hanson and Powell 2006a and 2006b, Christensen and Thomas 2008, SDWA 2008). PUR is a two-stage combined flocculant and disinfectant in powdered form delivered in small packets; it can disable or remove pathogens responsible for diarrhea, including viruses, parasites, worms, and bacteria, as well as arsenic and other contaminants harmful to humans. P&G describes the product as “a mini water treatment plant in a packet” (PUR website 2010). Each PUR packet contains a pre-measured compound designed to be mixed with 10 liters of water. The mixture must be stirred for five minutes, allowed to flocculate (the binding process between pollutants and active ingredients), settled, and poured through a cloth filter into a second container, where it undergoes final disinfection through timed-release chlorine in the water. PUR can dramatically improve the appearance of turbid water from surface sources, as well as improve the quality.

PUR was developed through joint research with CDC, and launched in 2000 as part of a portfolio of philanthropic activities that included the production of low-cost health and hygiene products specifically targeted to low-income markets. These products were intended to help P&G combine corporate social responsibility (CSR) and market expansion objectives in developing countries (Hanson and Powell 2006a).

### Market-testing phase

In Guatemala in 2001, village-level trials at markets, schools, and health clinics and in homes produced a positive response from consumers. P&G later conducted large-scale market tests in both the Philippines and Guatemala, yielding market penetration rates of 15 percent in the Philippines and 5 percent in Guatemala (Garrette and Karnani 2009). In 2002, P&G tested the product in Morocco and Pakistan and achieved much higher penetration rates (as high as 50 percent in Pakistan, in part with the support of a school program). Nevertheless, PUR was seen by many in the P&G senior management team as a product that required too much investment in awareness and promotion to be profitable (Hanson and Powell 2006).

Under the leadership of Dr. Greg Allgood, director of the Children’s Safe Drinking Water program, P&G sought to explore alternative models of distribution for PUR and secure the help of nonprofit organizations and donors. The opportunity arose with the creation of the Safe Drinking Water Alliance (SDWA), a USAID-support PPP that comprises P&G, PSI, the Johns Hopkins University Center for Communication Programs (JHU-CCP), and CARE. The goal of the Alliance was to test three marketing models to increase demand for water treatment products and to determine PUR’s potential as a new



POU technology. The three models included a commercial marketing model in Pakistan, a subsidized social marketing model in Haiti, and an emergency relief model in Ethiopia (SDWA 2010).

In Pakistan, a pre-testing “micro-sale” marketing phase of PUR took place in Sindh Province and used community-based promotion aimed at women, teachers and schoolchildren, shopkeepers, and opinion leaders. The program also reached out to shopkeepers and opinion leaders in target communities. The micro-market tests showed 40–60 percent repeat customers and was followed by a large-scale product campaign using mass media (two TV ads) and point-of-purchase promotion. During the campaign, P&G mobilized a distribution network that reached 88 percent of retail outlets in Sindh province and invested heavily on a trained sales force, achieving high levels of distribution coverage. Every sachet of PUR was sold to distributors at Rs. 3.32, (US\$0.053) and then sold to the public at Rs. 5 (US\$0.08), providing a high return of 50.6 percent per sachet for the retailers (SDWA 2010).

In spite of these efforts, PUR was unable to achieve repeat purchase rates of more than 5 percent in a period of six months, which P&G felt came from a core group of early adopters. In late 2004, P&G disbanded the PUR sales force in Pakistan, and abandoned its commercial strategy for the product.

### **Transition to corporate social responsibility**

In Ethiopia, CARE introduced PUR through an outpatient program to alleviate severe malnutrition and evaluated both its user acceptability and its potential to reduce diarrheal morbidity in enrolled children and other household members. Data collected from Ethiopia suggested a reduction in diarrhea morbidity and high acceptability the product. Many users, however, commented negatively on PUR’s chlorine taste and odor (JHU-CCP 2010).

P&G responded decisively to the need for safe drinking water after the 2004 Indonesian earthquake and tsunami, providing 13 million PUR sachets to affected countries through emergency programs. PUR’s contribution to disaster relief and diarrhea prevention programs eventually convinced P&G to continue to manufacture and sell the product at cost to NGOs and social marketing partners promoting public health. By the end of 2006, PUR was available on a sustained basis in 10 developing country markets, mostly through NGO partners. Thanks to the social marketing and disaster relief models, P&G provided 220 million sachets in six years (Allgood, personal communication, 2010). P&G will provide more than 100 million packets in 2011 and has committed to build a new manufacturing plant in Singapore so they can continue to scale up the program and provide more than 200 million PUR packets every year.

### **Lessons learned: PUR**

Extensive market testing demonstrated that PUR is not commercially viable in a developing country setting, at least according to the profitability standards of P&G, a multinational Fast Moving Consumable Goods (FMCG) company. In the three markets where the product was launched with marketing support from the company (Guatemala, Philippines, and Pakistan), repeat purchase rates failed to generate the return on investment required by P&G. Each test market was terminated and written off as financial loss (SDWA 2008). Many lessons were learned, however, from these tests.

Respondents participating in the 2003 Guatemala trial reported cost as the main reason for not using PUR. Respondents also mentioned time-consuming preparation, unpleasant taste, and limited availability as drawbacks associated with PUR (SDWA 2008, Luby et al. 2008). PUR may be a product that people are willing to use in periods or emergency despite these drawbacks, but not willing to pay for or use on a regular basis. PUR is typically subsidized, even when sold through a social marketing program, and its

repeat purchase rates have remained low. By and large, its primary function seems to be emergency relief or water disinfection in highly contaminated or turbid contexts.

Nevertheless, P&G's willingness to keep producing PUR at cost for social marketing and emergency relief programs constitutes an invaluable contribution to public health. The PUR product is an important part of the company's CSR strategy, which includes making product and monetary donations to respond to international disasters. PUR's success in saving lives has earned P&G visibility, recognition, and several highly prestigious international CSR awards, generating goodwill for the company and brand recognition throughout the globe.

### 3.2 AIR RAHMAT IN INDONESIA

One of the oldest and most widely used commercial water disinfection products is sodium hypochlorite, commonly known as bleach (Sobsey 2002). Use of household bleach for POU treatment ranges from an average of 0.9 percent of households in Southeast Asia, to 4.5 percent in Africa and 18.7 percent in the Latin America/Caribbean region (Rosa and Clasen 2010). The use of this type of chlorine is seen as the most effective approach where resources are limited (Clasen et al. 2007). However, the CDC has advised against using locally produced bleach products in POU programs due to the difficulty of ensuring consistency in quality (Lantagne 2009).

The SWS, developed by the CDC, employs sodium hypochlorite specifically manufactured to food grade standards, with the concentration and dose calculated to respond to the chlorine demand in the local water source and the typical volume of the household water storage container. It also encourages the use of improved water storage containers fitted with lids and spigots, and applies behavior change techniques, including social marketing, community mobilization, motivational interviewing, communication, and education to motivate adoption of the product and associated behaviors (CDC 2010). The SWS has been mostly implemented by PSI and supported by donors. The sodium hypochlorite product, which is typically manufactured under contract with a local manufacturer, is branded and sold through social marketing distribution networks in 25 countries.



The Aman Tirta project in Indonesia (2005–2010), based on the SWS system, was designed to achieve commercial viability. Indonesia is a challenging market for a chlorine POU product. For decades, Indonesians have relied on boiling as a method to purify their drinking water, partly as a result of government promotion of the method. However, increases in the price of kerosene, which is used to boil water, and air pollution, caused by burning kerosene and firewood, created a favorable environment for the introduction of a new POU method in Indonesia (Asian Development Bank [ADB] 2007, Institute for Public Health and Water Research [IPWR] 2010).

The product, branded *Air RahMat* (Blessed Water) is packaged in a 100ml bottle that can treat approximately 660 liters of water, or the average amount of drinking consumed by an Indonesian household in one month. Air RahMat was positioned as a highly economical water treatment (16 times cheaper than boiling), capable of killing harmful germs and bacteria and providing extended protection against disease through residual chlorine.

## **Public/private partnership model**

The USAID-funded Aman Tirta project was structured as a PPP that brought together a consumer products manufacturer (PT Tanshia), a local commercial distributor, JHU-CCP, and CARE International Indonesia. The project was described as the “first fully sustainable commercial model for safe water systems” (JHU-CCP 2008).

Aman Tirta was implemented in two provinces (eight districts) with an estimated population of 10.25 million. Extensive resources were invested in creating demand in the consumer market for Air RahMat, including radio jingles, television spots, and promotional leaflets. Through the media, Air RahMat was promoted as a safe and economical alternative to boiling and bottled water. At the community level, a mobilization program involving schools, local health centers (*Posyandu* and *Puskesmas*), and local leaders increased awareness of water-borne disease and promoted safe water practices. Mobile road shows using sampling trucks outfitted with water tanks created high visibility for Air RahMat in targeted communities. The product was made available in traditional outlets (stores and kiosks) and through community-based organizations (JHU-CCP 2010).

### **Lessons learned: Air RahMat**

Within a year, more than 1 million bottles of Air RahMat were sold through 500 traditional retailers, and 350 nontraditional distributors (Alkadrie 2007). Results from a first round of surveys in North Sumatra indicated that product awareness had grown from 5.1 percent at product launch to 51 percent six months later in September 2006. A health and economic impact study conducted in 2008 also revealed significant changes in attitudes regarding water treatment methods, with 41 percent awareness of Air RahMat in targeted areas, and a 50 percent decrease in reported diarrhea in households where Air RahMat was in use. Product sales and changes in targeted behaviors, however, failed to meet 2008 project targets (JHU-CCP 2008).

As Aman Tirta neared graduation, the project focused on transferring program activities to private sector partners, and securing the support of the Indonesian Ministry of Health (MOH). In February 2010, Indonesia’s Director General for of Disease Control and Environmental Health simultaneously launched the National Network for Household Water Treatment and Safe Storage, and oversaw the transfer of the Aman Tirta program to the MOH and private sector partners. Sales of Air RahMat remain sluggish, particularly in rural areas, and the viability of the product appears to be dependent on continued support from the public sector (Ainslie 2010).

Building a sustainable market for a chlorination product in a country where there is a long-standing tradition of boiling drinking water is a long-term effort that requires engagement by numerous partners from different sectors. The Aman Tirta project successfully advocated to include POU and safe storage as a key pillar in the MOH’s strategy for improving hygiene and reducing diarrheal disease in vulnerable populations. As a result, district health staff were trained in safe water practices and the use of Air RahMat in East Java health centers (JHU-CCP 2008). The MOH has now issued a General Guidance Policy for POU, initiated programs in 10 districts, and facilitated the creation of a national network of institutions working on the promotion of a range of POU methods (including Air RahMat). Provided that PT Tanshia, the Indonesian manufacturer of AirRahmat, continues to invest and collaborate with health authorities, it now has a much improved environment in which to market its product to consumers, including those at the BOP.

### 3.3 WATER FILTERS IN INDIA

In India, manufacturers of home water filters (called “purifiers”) have been fiercely competing for the urban consumer market, which remains relatively untapped (less than 7 percent of households in India use commercial filters). The total market for filters in India is valued at nearly US\$180 million and is thought to offer tremendous growth potential. Filters sold on this market use various technologies, mainly ultra violet, reverse osmosis, and chemical-based technologies. The low-cost chemical purifier market in India, which includes Eureka Forbes’ AquaSure and Hindustan Unilever (HUL)’s Pureit, is growing the fastest at 60 percent (compared to a 15 percent growth rate for expensive water purifiers) per annum (Roy 2009).

Purifier manufacturers have used a combination of commercial approaches, such as celebrity-backed mass media advertising and direct marketing (such as door-to-door visits) to build market share. Competition between filter manufacturers has intensified in recent months, reflected in aggressive public relations campaigns and innovative approaches for tapping into new user groups (Netscribes 2010). As is the case for other water treatment products, there is a higher likelihood of adoption in urban areas, and demand is very seasonal. Eureka Forbes reported that 60 percent of its sales occur during the three-month monsoon season (*Economic Times* 2010).



#### Strategies to reach the BOP

Manufacturers have been actively trying to reduce the biggest entry barrier to filters at the BOP: their relatively high price. Even the least expensive products (such as Pureit, which retails for less than US\$40) require refill purchases of consumables (“batteries” or “cartridges”) that are unaffordable to the poor. Eureka Forbes reportedly launched a service that allows families to rent a filter for less than US\$10 a month, and has set up water filtration plants in villages where safe water can be purchased for a few cents a liter (Roy 2009).<sup>1</sup>

Microfinancing is increasingly seen as the solution for making durable goods, including water filters, available to low-income people. Several programs to extend credit to existing microfinance recipients for the purchase of filters have been implemented with the support of USAID and the Bill and Melinda Gates Foundation. The AED-managed POUZN project supported partnerships between filter manufacturers and community-based NGOs with microfinance arms to address major barriers to entry at the BOP: low ability to pay, lack of credit terms, and challenging logistics. POUZN initially partnered with HUL to distribute its Pureit filter, and later expanded the project’s product portfolio to include filters made by manufacturer Ion Exchange (Saadé 2010).

Starting in 2009, HUL established its own direct partnership with Spandana, a local Indian microfinance institution to extend micro-lending terms to its client base for the purchase of Pureit filters. Through this channel and payment scheme, HUL has reportedly achieved double-digit market penetration among low-income consumers (PATH 2010a). HUL is also exploring various discount schemes for the filter in an effort to assess whether lower entry prices will help increase sales of its refill disinfection cartridges.

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<sup>1</sup> Note that such a community water supply approach does not resolve the issue of contamination occurring during transport to the household and storage, which is one of the benefits of POU.

The latest introduction on the filter market is resolutely targeted at BOP consumers, further demonstrating industry interest in this market. In late 2009, the Indian industrial conglomerate TATA Group, also known for producing the world's cheapest car (Nano), launched a new water purifier aimed at lower-income households in rural areas. The Swach filter uses ash from rice milling to filter out bacteria, and does not require running water or electricity. The product is marketed in two versions starting at US\$16.50. Although the filter requires periodic replacement of its active component, the TATA Swach Bulb™, the company aims to deliver safe drinking water for less than US\$0.66 per month for a family of five (TATA Chemicals 2010). In July 2010, the company reported cumulative sales of 20,000–25,000 units in the states of Maharashtra and Karnataka, and aimed to sell over one million units of water filters by March 2011 (Earth Times 2010).

### Lessons learned: filters

The lessons of donor-funded partnerships with Indian filter manufacturers have not been widely disseminated. It is unclear for example whether microfinancing and village-based behavior change programs are viable in the long term, and whether they can successfully encourage the use of refill cartridges that ensure correct use of the filters. Nevertheless, Eureka Forbes, HUL, and the TATA Group have demonstrated their high interest in the BOP, though their interpretation of this segment may vary from that of donors. Any effort by manufacturers to “move down the pyramid” in their marketing of POU products is beneficial to society because it allows the public sector and donors to target their resources towards those with the fewest resources and options.

## 3.4 AQUATABS

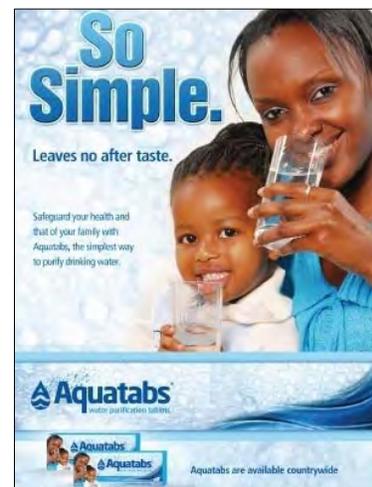
Aquatabs are effervescent chlorine tablets that kill micro-organisms in water to prevent cholera, typhoid, dysentery, and other water-borne diseases. The product can be formulated in different sized tablets to treat volumes of water ranging from one liter to 2,500 liters and has a shelf life of five years. Aquatabs are manufactured by Medentech, a company established in 1984 in Wexford, Ireland.

As a manufacturer based in a developed country, keeping product costs as low as possible while remaining commercially viable is one of Medentech's most pressing challenges. Investments in research and development (R&D) and continuous technological improvements have enabled Medentech to offer a product that is easy to use and can be quickly shipped to remote areas.

### Multi-level supply chain

Departing from its initial policy of supplying Aquatabs exclusively to the military and relief emergency organizations, Medentech has been investing heavily in creating a viable consumer market for Aquatabs in developing countries. To date, the product has been introduced through both commercial and NGO channels in 28 countries in Asia, Africa, and Latin America (Medentech 2009).

Medentech's approach to emerging and developing countries is primarily based on the development of efficient and reliable supply chain systems. This is the strategy used by most FMCG companies with a global presence. The classic distribution model has three levels: producer, wholesaler and retailer. For



international markets, additional intermediaries such as local agents and distributors are usually needed to ensure the registration, importation, and warehousing of products.

In most countries, Medentech uses a three-legged distribution model corresponding to major market segments for Aquatabs:

1. Commercial market including local importers, distributors, wholesalers, and retailers. Local agents contracted by Medentech use working capital to purchase, transport, and deliver products. They also invest in sales staff and promotional techniques to “push” products down the supply chain. They seek to maximize profits through economies of scale, often spreading operating costs over hundreds of products.
2. Quasi-commercial, including social marketing, microfinance, community-based, and other donor-funded organizations that sell products rather than give them away. These groups may use commercial retail or door-to-door channels, mass media communication, and/or financing mechanisms to increase the adoption of health products, with a special focus on underserved populations.
3. Institutional emergency market: comprises agencies and NGOs that procure HWT products based on need for disaster relief or humanitarian purposes. Medentech’s main institutional clients include the WHO, UNICEF (United Nations Children’s Fund), the Red Cross, Médecins Sans Frontières (Doctors Without Borders), and Oxfam.

Medentech managers refer to this supply system as a “hybrid social distribution model.” This model is consistent with the way many multinationals companies see the developing world: comprises segments presenting various degrees of difficulty and profit potential. Pharmaceutical companies have long argued that low-income groups are best served through their institutional clients, such as governments, donors, and nonprofit groups. What makes this model different is that the middle and lower parts of the pyramid are served directly by Medentech, using highly involved approaches, rather than through tenders or institutional orders. In the long run, Medentech aims to build a sustainable market that can grow without donor support.

Medentech typically uses commercial distributors to supply emergency programs, for which they keep stock in country to ensure quick delivery. Commercial distributors are tasked with placing Aquatabs in pharmacies, supermarkets, and convenience stores. Those who need POU products the most, however, cannot always be reached through commercial approaches alone (POUZN 2007). Thus, social marketing and community-based organizations have become a very important part of the Aquatabs supply chain to reach BOP populations, particularly in sub-Saharan Africa.

### **Pricing strategy**

Keeping Aquatabs as affordable as possible, while remaining commercially viable, is one of Medentech’s major goals. Many global manufacturers approach emerging markets with a set pricing structure designed for developed markets. As a result, their products can only be purchased by a small number of upper-income consumers. Medentech uses a different approach: its pricing structure accounts for production, shipment, and distribution costs, including customary margins and wages throughout the supply chain, as well as a fixed contribution to marketing costs (around 10 percent).

## **Lessons learned: Aquatabs**

Medentech's main challenge in low-income developing countries, where its product is in highest need, has been to identify cost-effective strategies to create demand for the product while keeping prices low. With razor-thin margins, the company cannot afford to invest heavily in classic marketing techniques, though it typically insists on a cost-sharing agreement with its distributors to reinvest a portion of net profits in advertising and promotion. Medentech has become adept at creating networks of partners, such as social marketing and community-based organizations that can help create demand for the product. The company has also shown a willingness to explore nontraditional and innovative approaches to market building, from micro-entrepreneurs in Ghana, to bicycle sales teams in India

Medentech has set a target of 10 billion tablets of Aquatabs sold annually (equivalent to 100 billion liters of water treated) by the year 2014. To meet this ambitious challenge, the company must position Aquatabs as a consumer product rather than one used only in emergencies. The success of this strategy is highly dependent on the ability of local agents to design effective marketing programs for Aquatabs. But it is also largely predicated on the efforts of health authorities, NGOs, and international organizations to influence attitudes and practices relating to household water treatment. As a result, Medentech places high value in the development of local partnerships with key players in the POU community.

## 4. ACHIEVING SCALE AND VIABILITY

The four commercial ventures described above differ widely with respect to project design, financing, and the role of manufacturers. In the case of filters in India, experimentation with BOP approaches is led by the manufacturers themselves with little or no donor involvement. In contrast, the Air RahMat project in Indonesia was conceived by a donor-funded organization in partnership with a local manufacturer, with the aim of achieving commercial sustainability. The PUR venture was initiated by P&G through a research-based alliance with the CDC and evolved into a corporate social responsibility initiative after a corporate decision to abandon commercialization plans. Medentech expanded its Aquatabs business from disaster relief to consumer market development, using a company-designed partnership model.

In the case of filters, there is widespread knowledge of these products and growing demand for them among mainstream consumer groups. Thus, the key challenge for manufacturers is to identify innovative distribution channels and invest in R&D in order to make filters more affordable and easily accessible to people at the BOP.

Unlike filters, chlorine-based products are not established consumer goods. Because they are very low cost but repurchases only occur monthly, the priority for manufacturers is to build a large consumer base of regular users. These companies need the support of donors and governments to build a market for their products, especially if they are focusing on the BOP as their market entry point. PUR, Air RahMat, and Aquatabs all required substantial investment in demand creation and public health education, which no manufacturer can afford to do while keeping prices low.

### 4.1 MARKETING CHALLENGES

The water treatment market is challenging because areas with the highest need are not necessarily those with the highest sales potential for POU products, at least initially. Demand for water-related products and services are predominantly from urban and middle-income groups, even in countries where most households are rural and poor. For this reason, commercial manufacturers often build markets from the top and middle of the socio-economic pyramid then work their way down to lower-income markets. Even at the BOP, demand has grown fastest in peri-urban areas (Hammond et al. 2007). Rural areas, though their need for safe water may be high, represent the most challenging market for suppliers (IFC 2009).

Successful commercial marketers eliminate “unlikely” customers from the outset. Rather than spend considerable resources and time trying to sell a new product to skeptical audiences, they aim for the “lowest hanging fruit,” or in order of priority: 1) users of competitive products; 2) users of alternative products or methods; and 3) non-users with a perceived/expressed need for a product. The combined purchases of the first two groups represent actual demand. When aggregated with the estimated potential demand from the third group, they make up the total potential market for the product.

In the POU water treatment market, a manufacturer might choose to compete head-to-head with makers of similar products on the basis of increased affordability or improved features, as TATA did with its new filter in India. Offering a lower-priced product may also attract consumers who previously

could not afford one (but wished they could), thus growing the potential market. These may include people at the BOP who have a need for a water treatment method but lack access to POU products or cannot afford one.

Marketing products that are unknown or not used on a wide scale by mainstream consumers (urban, middle and lower-middle class) is more challenging. Targeting people at the BOP without building a constituency in other income groups poses two major problems: 1) demand may not grow as fast as in other areas of the pyramid, and sales and profits will remain low; and, 2) the product could be pegged as a “poor person’s product,” jeopardizing its chances of attracting mainstream consumers. This is particularly true for durable products: in a study of low- and middle-income households in Vietnam, respondents mentioned “high aspirational value” as one of the most appealing aspects of household filters (PATH 2009b).

Manufacturers of filters used an effective approach to market building: they invested heavily in marketing and mass media advertising to build market share where demand was highest (urban, middle-class consumer segments) before exploring opportunities in rural areas. Today, their products are known, popular, and have high aspirational value. There is no solid evidence to date that sustainable markets can be built from the bottom up, but established manufacturers can develop business models to reach consumers at the BOP, including modifying products to meet their needs (Prahalad 2004).

Things become more complicated the lower one goes down the socio-economic pyramid where basic health education is necessary to create demand. Experience in marketing the SWS in low-income countries has demonstrated that marketing and communications efforts are critical for success. Social marketing messages may emphasize the economic benefits or the health benefits of POU. While the economic benefits include financial savings in averted clinic visits and avoidance of lost productivity due to illness, the health messages stress the relationship between untreated water and diarrhea, and POU’s role in maintaining health. The latter, in particular are deemed to be critical to the product’s adoption among the BOP.

Safe water campaigns also need to be aspirational and complementary to other diarrheal disease prevention and treatment campaigns (POUZN 2007). Thus, a key lesson from programs that have attempted to market household water disinfection products at the BOP is that behavior change challenges require significant time, sustained investments, and a range of innovative approaches.

## **4.2 POSITIONING POU PRODUCTS**

Fast-moving consumer goods rarely succeed on the basis of their technical merits alone (i.e., their ability to do a job). They are typically assessed within a frame of reference that takes into account the needs and wants of target consumers, as well as competitive products on the market. The term ‘positioning’ refers to a consumer’s perception of a product or service in relation to its competitors (Ries and Trout 1981).

Marketers must ask themselves: “how is my product perceived by consumers, and how is it different from the way they perceive my competitors’ products?” A water treatment product might be seen as something to be used during an epidemic, or as an alternative to daily boiling. It may convey high social status, or be dismissed as a product for slum dwellers. For those who worry about exposure to disease (especially for their children), it can be a life-saving product to be used consistently. Most donor-funded programs try to emphasize the latter in their communication. To be successful, however, this positioning

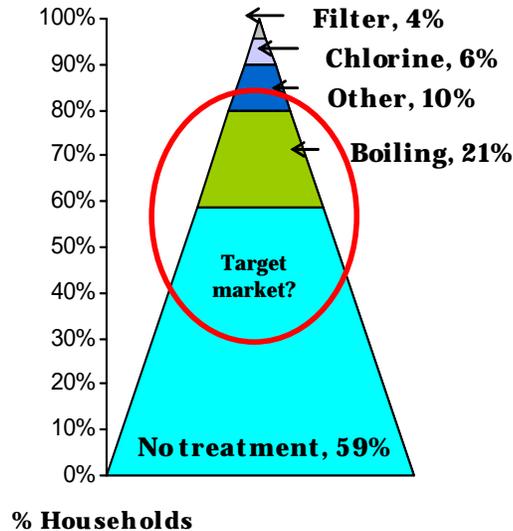
strategy must be consistent with actual perceived benefits (do people really think water treatment products are preventing disease?).

Commercial companies often try to create “lifestyle” brands because a positioning that appeals to social or aesthetic ideals can lead to higher sales. Bottled water became widely used in Europe following highly successful campaigns around the concept of “mineral” and “pure” water. In India, bottled-water consumption has grown 50 percent annually over the past several years, despite reports of contamination in several popular brands (CorpWatch 2003).

Today, there are essentially two classes of marketable POU products: low-cost chemical products (such as chlorine solution and tablets) that must be purchased frequently (FMCG), and more expensive “durable” products such as filters. In India, filters were initially marketed to upper- and middle-income segments, and over time became associated with a high social status. These companies may not have consciously intended to portray their filters as “for the rich” but this positioning likely resulted from their targeting and pricing decisions, as well as their choice of distribution and communication channels. Likewise, chlorine manufacturers do not necessarily want their products to be seen as “for the poor” or “for emergencies” but these perceptions can result from targeting low-income populations and communication campaigns that focus on health rather than lifestyle benefits. Both durable and FMCG product manufacturers may need to change their positioning to build a market at the BOP: durable goods should be promoted not just as status symbols, but as health products, so that their owners invest in cartridge replacements. And low-cost FMCG products should be positioned as lifestyle-enhancing products to encourage regular use.

People who already treat their water can be prime targets because they are likely to be receptive to technological improvements, or more affordable solutions. The size of the population using a chlorine-based product or a filter, however, tends to be very small. A larger group is made of people who boil their drinking water on a regular basis. In the developing world, boiling is the predominant form of water treatment (Figure 1). For example, in Southeast Asia, “boilers” make up 91 percent of the water treatment market in Vietnam, 60 percent in Cambodia, and 27 percent in the Philippines (Rosa and Clasen 2010). A product targeted at “boilers” must offer substantial advantages over boiling. One key benefit might be cost (for example, treating water with a chlorine-based product is much cheaper). Another one is convenience (boiling large quantities of water is cumbersome), and a third potentially winning benefit could be effectiveness (chemicals prevents recontamination). If market research determines that “boilers” are receptive to these benefits, it may be worth investing in promoting the product to this group.

**FIGURE 1: PERCENTAGE OF HOUSEHOLDS REPORTING THE USE OF POU IN THE WHO REGION (67 COUNTRIES)**



Source: Rosa and Clasen (2010)

A case can also be made that the non-user segment includes many more people than in any other segment, and thus offers much more growth opportunity. In order to make good business sense, this strategy would have to be targeted at those who have a perceived need for a treatment product. These potential customers are likely to have higher income and education level than others in the non-user segment (Rosa and Clasen 2009, Rheingans and Dreibelbis 2007). All other non-users are beyond the reach of a purely commercial strategy, because they require substantial investments in behavior change programs. Working in collaboration with social marketing or community-based organizations, however, makes it possible to benefit from increases in demand resulting from behavior change programs.

#### **Diffusion of Innovation Framework:**

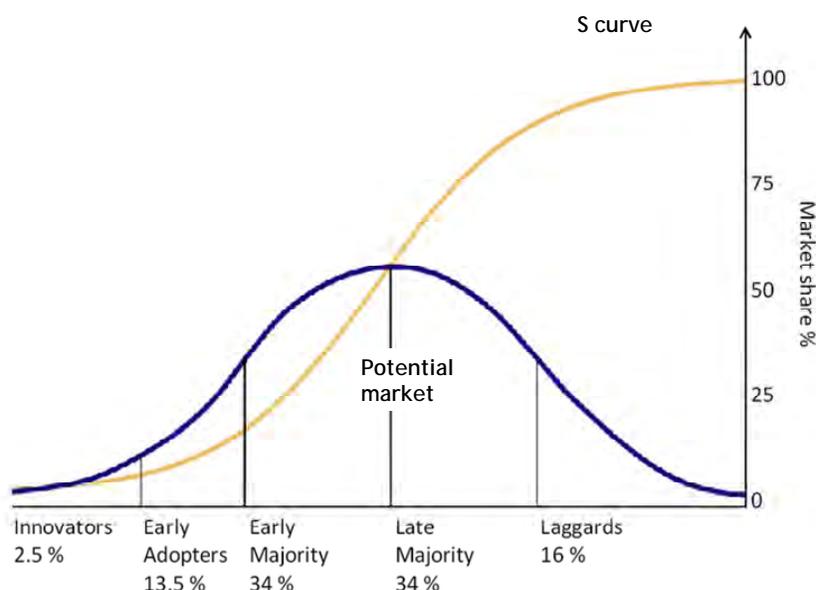
The DI framework considers five main types of users who when aggregated represent 100 percent of the potential market for a product. **Innovators** (2.5 percent) tend to be venturesome, educated people who belong to higher social classes and have access to multiple information sources. **Early adopters** (13.5 percent) are typically social leaders who are more educated than average. The **early majority** (34 percent) is slower in the adoption process, but still has above average social status and some leadership ability. In contrast, the **late majority** (34 percent) and the **laggards** (16 percent) tend to be skeptical, traditional, and belong to lower socio-economic status. Laggards especially are traditionalists who rely mostly on neighbors and friends as their main sources of information. The DI theory has been adapted for social marketing (Kotler and Roberto 1989) and is also frequently referred to in the context of POU programs (Clasen 2009, Heierli 2008, Harris 2005).

### 4.3 UNDERSTANDING CONSUMER BEHAVIOR

The Diffusion of Innovations (DI) model (Rogers 1962, 1995) is particularly helpful in understanding where a product or behavior stands in the market, and designing strategies to increase its adoption. The theory states that individuals who are predisposed to do so will adopt an innovation earlier than those who are less predisposed. Rogers stated that the potential market for a new product or technology can be segmented into several types of consumers: innovators, early adopters, early majority, late majority, and laggards. With successive groups of consumers adopting the new product/technology, its market share eventually reaches the saturation level.

Figure 2 shows a bell-shaped distribution of the potential market for a new product and the percentage of potential adapters theorized to fall into each category. The diffusion process in a social system follows an S curve in which the adoption of a technology begins with slow change, is followed by rapid change, and ends in slow change as the product matures or new technologies emerge.

**FIGURE 2: DIFFUSION OF INNOVATIONS THEORY**



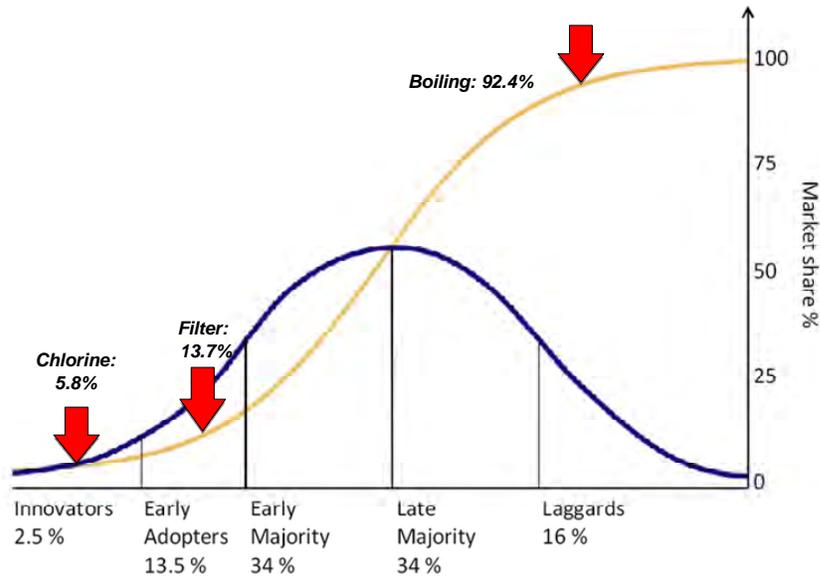
Source: Wikimedia Commons. <http://commons.wikimedia.org/wiki/File:Diffusionofideas.PNG>. Based on Rogers (1962).

At the community level (village, slum, refugee camp) potential users can also be segmented according to the categories described in DI theory. If a chlorine-based product or filter were to be introduced in a rural village, for example, identifying potential innovators and leveraging their influence to build a constituency of early adopters would be consistent with DI theory.

The theory can also help compare different products or behaviors relating to water treatment and determine an appropriate marketing or behavior change strategy. There are significant differences between regions of the world, and between countries in the same region. The adoption of safe water behaviors and products is likely to be influenced by government campaigns, donor support for POU methods and products, and investments by commercial manufacturers. Figure 3 shows that boiling has become quasi-universal in Vietnam, which is reflected both in an adoption curve nearing 100 percent,

and a market share that now includes some of the laggards. Because 94.8 percent of the population is already treating water with this method, generating significant uptake for new safe water products inevitably implies competing with boiling as a treatment method.

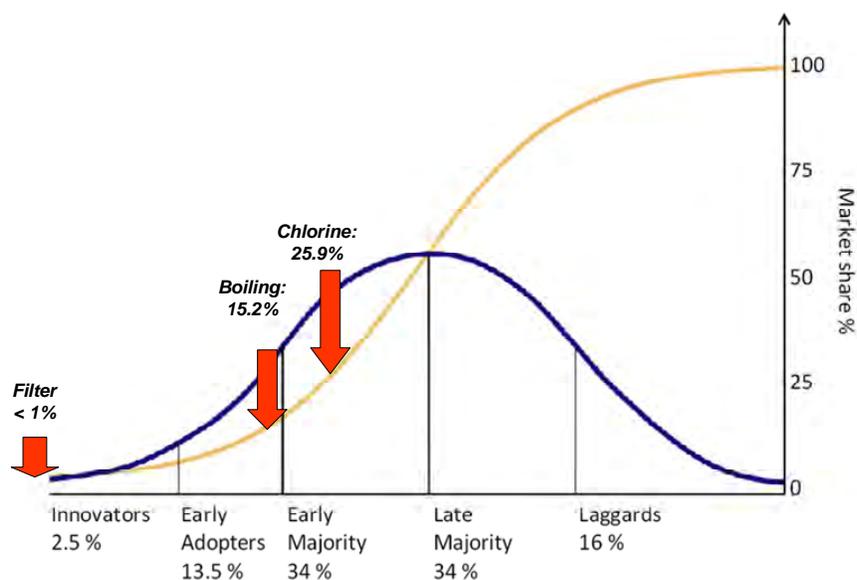
**FIGURE 3: USE OF HOUSEHOLD WATER TREATMENT METHODS IN VIETNAM (2006)**



Data source: Rosa and Clasen (2010)

In sharp contrast with the Vietnam market, Zambia, where only 34.9 percent of households treat drinking water, shows almost no filter use and modest use of boiling, but significant uptake in chlorine-based methods (Figure 4). With a user base of 27.2 percent, chlorination as an innovation is capturing consumers in the early majority group, suggesting that momentum is building and may be followed by rapid increases in adoption of this method. In a market such as Zambia, there is still room for new products to build market share. Because pre-2007 water-related data are not available from Demographic and Health Surveys (DHS), the use of boiling prior to the large-scale introduction of CLORIN, PSI’s chlorine-based safe water product, is not known. Users of the method may have been households that previously boiled their drinking water, or did not treat their water at all.

**FIGURE 4: USE OF HOUSEHOLD WATER TREATMENT METHODS IN ZAMBIA (2007)**



*Data source:* Central Statistical Office, Ministry of Health, Tropical Diseases Research Centre, University of Zambia, and Macro International Inc. 2009.

Low-income countries with relative tolerance for the taste of chlorine may offer more long-term potential for chlorine-based products because these products tend to be very affordable. In Haiti, another low-income country where 33 percent of households treat their drinking water, the use of chlorine-based products was 30.5 percent in 2006. In contrast, only 2.1 percent of households reporting boiling their water and less than 1 percent used filters. In other countries where higher incomes may also have attracted filter manufacturers, new users may be more likely to shun chlorine-based products. In Brazil, almost 64 percent of households treated their drinking water in 1996 (last year for which DHS data are available), capturing the “late majority” segment of consumers, but they did so mostly with filters. High adoption rates do not necessarily translate into commercial viability. In Zambia, PSI’s oldest POU program (1998), the product price is still subsidized for the most widely used product (CLORIN). In contrast, the market for filters in India is mostly commercial in nature but the penetration rate of this method is only 7.8 percent, which places it in the innovators segment.

FMCG products like the SWS and Aquatabs have substantial growth potential (at least in Africa where there may be higher consumer acceptance for chlorination), because they are low cost and supported by donor-funded programs, though scale-up may take more than the typical five-year donor project cycle. In contrast, filters, which have proven consumer appeal, seem to do best in middle-income countries, such as Brazil, the Dominican Republic, Jordan, and Thailand (Rosa and Clasen 2010), where more people can afford them. Thus building a sustainable market for POU products requires methods that are not only commercially viable in the long run, but also accessible to large segments of the mainstream population.

## 4.4 USING BEHAVIOR CHANGE THEORY

The DI model provides a useful guideline for market segmentation and the development of a targeting strategy, but it is not a substitute for a behavior change theory. Everett Rogers identified five stages in the adoption process: knowledge, persuasion, decision, implementation, and confirmation (Rogers 1962). Other theories, such as the Health Belief Model (Rosenstock 1966) or the Transtheoretical/Stages of Change Model (Prochaska and DiClemente 2005), may be appropriate for water-related behaviors.

Significant research has been done on the determinants of use of POU products, showing for example that habits and social influence are strong predictors of water-related behavior (Moser et al. 2005). Motivational interviewing and community mobilization have been shown to increase the health impact of social marketing programs (Quick 2003, Thevos et al. 2000). Both research and field experience suggest that the introduction of POU technology without behavioral, motivational, educational, and participatory activities within the community is unlikely to be successful or sustainable (Figueroa and Kincaid 2010).

Changing the behaviors of targeted population groups (consumer segments) beyond convincing them to adopt a product that can fill a perceived need is not within the capacity of commercial manufacturers and marketers. Marketing products to people who do not intend to change their water-related practices is a waste of time and resources. Ideally, behavior change interventions should accompany efforts to market new health products, yet few POU programs to date have developed effective models for changing behaviors and practices (Harris 2005, Parker et al. 2009). Refocusing donor and public sector resources on behavior change research, models and tools would not only increase the health impact of POU interventions, but also create markets for private suppliers of water treatment products.

## 5. PARTNERSHIPS TO BUILD MARKETS

The focus of donor-funded programs should be to meet the needs of the most vulnerable segments of the population who are not reached by strict commercial approaches. Safe water programs involving the provision of a commodity, however, must identify a sustainable product supply source if they are to reach a scale of public health impact, unless donors are prepared to subsidize POU products indefinitely. Sustainable supply can be achieved by allowing private sector manufacturers and suppliers to respond to the demand created by POU programs in less vulnerable populations.

### 5.1 BENEFITS OF COMMERCIAL PARTNERSHIPS

#### **Increased program sustainability**

USAID has been partnering with commercial manufacturers and distributors of health products since the mid-1990s. These partnerships have helped build viable markets for condoms, contraceptives, oral rehydration salts, insecticide-treated mosquito nets (ITNs), and nutritional supplements in developing countries. The basic strategy of these partnerships is for donor support to “push” demand down the economic ladder, while manufacturers and distributors focus on increasing product availability and/or affordability. When donor support is phased out, products typically remain on the market (SOMARC III 1997, Agha et al. 2006). The goal of these PPPs is that manufacturers take responsibility for the production, packaging, distribution, and marketing of their products. The role of donor-funded programs is primarily to help stimulate use among targeted populations through education and behavior change communication.

Manufacturers with a sound business model can supply POU products at full cost recovery, through sustainable supply channels, thus reducing the need for donor involvement. Well-managed companies are also inherently viable; while Medentech sells substantial quantities of product to institutional clients and donor-supported NGOs, its financial structure is built around the realization of a net profit. Commercial manufacturers already have a profitable market and can afford to explore new consumer segments and marketing/distribution schemes. On the other hand, commercial manufacturers cannot afford to invest large sums in public education, behavior change programs, or dedicated distribution channels, so they need partners to market their products at the BOP.

#### **Access to consumer research and R&D**

An important advantage in developing direct partnerships with POU manufacturers is access to new and/or improved products and technologies. PUR was developed through close collaboration between P&G and the CDC over a period of several years. Manufacturers also have an incentive to invest in technological improvements when consumers reject some feature in their product. After years of producing a commonly used NaDCC formula for disaster relief programs, Medentech invested in improving the taste of Aquatabs to increase its consumer appeal (Stafford 2009). Without access to R&D, POU programs may simply continue to promote adoption while ignoring a product’s drawbacks.

Manufacturers also have the capacity to develop and test new approaches using a similar technology. For example, Medentech has developed a chlorination system that can be used at the community level and does not require electrical supply. This may be a better option than tablets used in the household if people are more inclined to pay for safe water from a communal source than to consistently treat their water in the home.<sup>2</sup> A similar product based on electrochlorination<sup>3</sup> has been developed through a donor-funded partnership between PATH and Cascade Designs, Inc. a Seattle-based outdoor-gear manufacturer (PATH 2010b).

R&D is a key strategy in increasing access to household filters that have high consumer appeal but remain too expensive for many people with a need for safe water. Improving durability (i.e., reducing breakage) and reducing production costs are necessary to make these products affordable at the BOP. Product research, however, is costly and must be justified by high expected returns on investments. Reducing the business risk of investing in R&D with uncertain returns should be one area of focus for PPPs.

### **Access to private capital and commercial networks**

Once sufficient production capacity is achieved, global manufacturers have an incentive to register their brands in multiple countries, leverage local commercial networks, and invest in marketing to support their brands. Private companies also have the flexibility to target the entire socio-economic pyramid, starting with those most likely to be the first adopters of a new product.

Experience has shown that manufacturers are more likely to invest in market-building activities if they have the opportunity to cost-share with others through public health initiatives. Vestergaard Frandsen, a manufacturer of ITNs was a committed partner in NetMark, a 10-year project funded by USAID to create a sustainable market for ITNs. Using various cost-sharing schemes, NetMark encouraged commercial net suppliers to support their own brands, instead of merely supplying commodities to public sector programs (AED 2005). Vestergaard is still investing in the commercial market despite widespread donations of ITNs in the region. In 2009, it committed over US\$1 million to support its commercially marketed PermaNet brand.

## **5.2 A MODEL FOR PUBLIC/PRIVATE PARTNERSHIPS**

Public health programs and commercial ventures have very different purposes but can also share common goals. In the area of POU, the common goal is the rapid scaling up of the use of water treatment products in targeted populations at risk from contaminated drinking water.

Core consumer markets normally form in urban areas with a cash economy, and where high population density allows for easy product distribution and efficient dissemination of educational and promotional messages. In contrast, safe water project areas are often difficult to serve because local commercial networks only pull products in very high demand. POU thus can require subsidized distribution that is costly to sustain.

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<sup>2</sup> Unlike POU, communal chlorination may simultaneously benefit thousands of people, as opposed to just one household. Because of its larger scale, the range of stakeholders that must be engaged also requires broader coordination and outreach capacity. Cost recovery in communal schemes is also more complex, since the benefit of communal chlorination is shared, rather than captured by just one household. Small, informal (door-to-door or kiosk-based) vendors may not be equipped to manage the financial and logistical aspects of the community chlorination service.

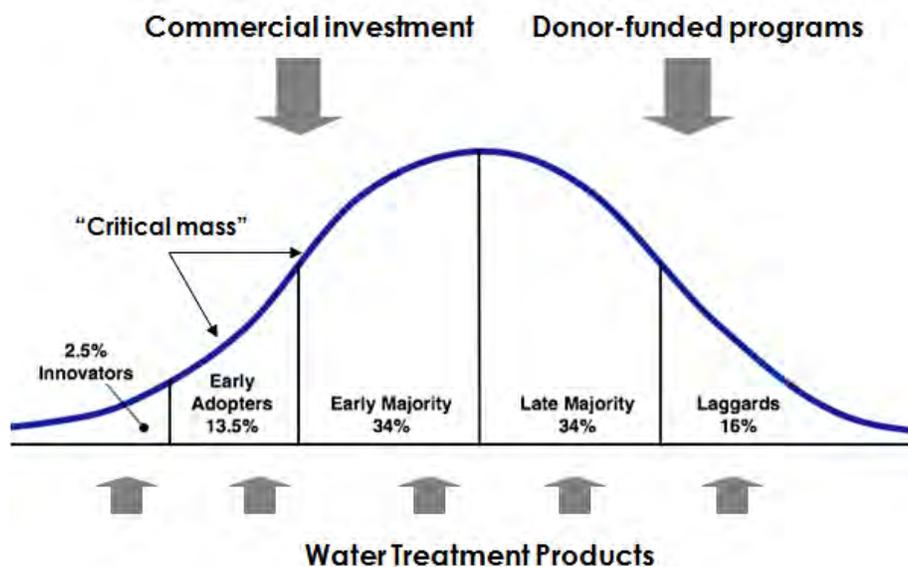
<sup>3</sup> Electrochlorination is a system that uses a power source, salt, and water to create a chlorine solution for POU (PATH 2010b).

To achieve scale-up at the national level and improve the sustainability of POU programs, commercial and public health efforts should be combined in a complementary fashion. The DI theory can help design PPPs to build sustainable markets that can also meet public health goals and address equity concerns.

Building a national-level market for POU products may happen faster if public resources are mobilized to convince late adopters and laggards that the innovation is the “new norm,” a very common approach in social marketing. Figure 5 illustrates how private and publicly funded entities might complement each other by investing simultaneously in different consumer segments to create a market for a POU product. Manufacturers that make affordable products can target multiple population groups through commercial channels and partnerships with community-based organizations.

A new product should first be aggressively marketed to innovators and early adopters (particularly opinion leaders) in order to maximize diffusion and build brand image. At the national level, this group may not be a priority for donor-funded POU programs because of its higher socio-economic composition. It is the role of the commercial sector to pursue this segment of the market. In countries where water treatment products are not perceived as technological innovations (and thus do not necessarily attract innovators), the DI theory may not be as useful. Instead, a strategy based on differentiation (such as marketing a new product as cheaper or improved alternative to existing products) may be more effective in building market share. For example, the target of a marketing campaign for Aquatabs might be households who routinely boil their water but are facing increasing fuel costs. Similarly, the TATA Group in India is targeting low-income consumers who previously could not afford a filter with a cheaper version of products already on the market.

**FIGURE 5: PUBLIC/PRIVATE ROLES IN SCALING-UP POU METHODS**



### 5.3 THE ROLE OF SOCIAL MARKETING

Social marketing is often seen as the perfect compromise between commercial approaches that do little to meet the needs of vulnerable populations, and donor-dependent public health initiatives. Social marketing programs have a long history of successfully marketing health products to people at the BOP. It must be noted, however, that these products (ITNs, contraceptives, or condoms) were already

commercially sold in other countries, whereas POU products (with the exception of commercial filters) are in many respects still being tested as viable consumer products.

The most important contribution of social marketing to scaling up the use of POU products is its ability to implement multiple interventions, including commercial approaches, behavior change communication, and alliances with community-based organizations. Social marketing organizations also target population groups with a large percentage of non-users, many of whom have no perceived issues with water quality and thus are more at risk of consuming contaminated water. For this reason, organizations like PSI, Agence pour le Développement du Marketing Social or ADEMAS, (in Senegal), the Social Marketing Company (in Bangladesh), and other NGOs involved in social marketing have a critical role to play in building demand for POU at the BOP. When there is a need for new or more affordable POU products, social marketing has also been instrumental in priming the market by introducing attractively packaged subsidized brands in commercial distribution channels.

On the other hand, social marketing programs are no substitute for sustainable commercial approaches because of their narrow focus (on lower socio-economic groups or select geographical areas) and their business model, which is highly dependent on continued donor support. NGO-based social marketing programs are geared towards maximizing uptake regardless of cost. For example, social marketers think of high prices and low access as major barriers to adoption and often use highly subsidized products and supply schemes (such as direct sales) to overcome these barriers. In contrast, manufacturers see pricing as a strategic marketing tool, one that must meet consumer expectations, build brand image, and secure the commitment of trade partners. The only upward limit to the cost of social marketing campaigns is what donors are willing to support, whereas commercial manufacturers must weigh their investment against expected returns. In short, social marketing can build demand and ensure affordable supply but is not set up to do so without sustained donor support.

Ideally, POU products can be produced cheaply and revenue from the sale of those products can recover most procurement and distribution costs in many countries. Ultimately, only sustained increases in demand can secure product availability at the BOP, whether or not it is donor-subsidized. Therefore, the focus of social marketing programs should be to research and implement new behavior change strategies that increase sustained use by targeted consumers.

## 5.4 THE NEED FOR CONSUMER RESEARCH

A 2008 report funded by the Swiss Agency for Development and Cooperation found that many water treatment solutions were still “half-baked,” having been developed for effectiveness and health impact, but without regard to consumers’ needs and wants, or commercial potential (Heierli 2008). A common mistake in public health programs that extends to market-based approaches adopted by these programs is mistaking products or services poor people *need* for things they actually *want*. Ideally, consumer tastes and preferences should be investigated in the early stages of product development. For example, Medentech has developed a successful price/distribution mix for Aquatabs, but has limited knowledge of its market potential as an everyday consumer good. Though it has been used by the military and by travelers from developed countries, Aquatabs was not initially tested with potential consumers in developing countries, let alone at the BOP. Consumer research is critical to understand lifestyles (psychographics), identify target consumer groups, and develop appropriate positioning strategies. Recently, Medentech has been working with public health institutions on consumer trials in Bangladesh, Brazil, Honduras, Indonesia, and Tanzania to obtain a better picture of the product’s marketability as a daily household product.

Some companies go a step further and advocate in-depth consumer research, followed by R&D and product development with the specific goal of meeting the needs and wants of people living at the BOP. Vestegaard Frandsen hired industrial engineers to study the behaviors of consumers in rural Mali, and then used the findings to refine the design of its LifeStraw and LifeStraw Family POU filters. The company's Executive Regional Director knows that products developed for BOP households do not necessarily appeal to other consumer groups, and may never be commercially viable. He believes, however, that sustained donor support is justified when it is used to provide those most in need of safe water with products that truly meet their needs (Soerensen 2009).

The Gates-funded PATH Safe Water Program has invested in considerable consumer research to explore appropriate targeting and positioning of commercial water treatment products. For example, the Safe Water Program in Vietnam found convenience, cost savings, water clarity and flavor, and association with a high social status to be winning attributes for safe water products (PATH 2009b). POU project managers looking to build sustainable markets for treatment products should conduct research into the actual marketability of these products and avoid settling for small-scale consumer acceptability studies conducted in project areas.

## 5.5 MARKET-BUILDING POLICIES

Donor-funded POU programs are not the only market for manufacturers of treatment products. Disaster relief and commercial retail sales represent important markets that typically coexist with POU programs in countries experiencing chronic water safety problems. A safe water policy that engages the public, NGO, and private commercial sectors can help ensure sustained access to POU products independent of donor funding cycles. National programs that mandate the mass distribution of POU products during a cholera epidemic should also encourage the sale of similar products through commercial outlets. Demand at those outlets will likely fluctuate throughout the year, but it is not a problem for commercial retailers accustomed to selling seasonal products. While inconsistent use of a POU product may be interpreted as a failure in the context of a donor-funded POU program, it is not incompatible with a sustainable demand-driven commercial market.

A policy that addresses all three aspects of the POU market is much more palatable for commercial suppliers than time-limited partnerships or public procurement programs, because it provides client diversification and predictable sources of revenue in a still nascent and highly seasonal market. A manufacturer is more likely to invest in a country that offers steadily growing demand for its products across different sectors. For example, sub-Saharan Africa offers high potential for volume sales through emergency orders triggered by recurring cholera epidemics (Kenya, Zimbabwe), even as prospects for building commercial markets for safe water products in this region remain elusive. According to Medentech, the local procurement for emergency response provides an important incentive for local distributors, and a source of revenue that can be re-invested in commercial marketing of the Aquatabs brand.



## 6. CONCLUSIONS

Manufacturers of water treatment products have a critical role to play in scaling up POU interventions to reach BOP populations and making them more sustainable. Through consumer research, R&D, and investments in marketing, manufacturers help position water treatment products as bona fide consumer goods, resulting in more viable and faster-growing markets.

Sustainability concerns often take a back seat when programs are under pressure to show health impact, and no one really expects donor-funded POU programs to turn into profitable businesses. Many NGO programs use donor resources to subsidize product price, distribution and promotion. Therefore, as demand increases, increasing levels of subsidies are needed to ensure continued supply. Commercial-based approaches have an important role to play in ensuring the long-term supply of products through private sector channels.

There is an opportunity for increased public/private collaboration in countries where donors are currently funding POU programs. Manufacturers can help build a viable market for water treatment products that will free up donor resources for targeted interventions. Some companies have shown a willingness to invest corporate resources in product improvements, consumer research, and a fast-expanding distribution network. Better coordination of efforts through partnership-based programs, and a more consistent dialogue between manufacturers and donors will result in greater sustained impact.

Partnering with manufacturers, however, implies the existence of a commercially marketable product with proven consumer appeal. Chlorination products are cheap and easy to distribute but still aren't accepted as everyday household products. Durable products such as filters have achieved commercial success but are only marketable to middle-income consumers unless cost, supply chain, and durability issues can be addressed. Clearly, the commercial sector must do its part by investing in consumer research and improved consumer marketing.

For their part, donor-funded social marketing organizations must improve their understanding of what influences water-related behaviors, and design effective strategies to motivate the adoption of POU at the BOP. Partnerships with manufacturers, combined with effective behavior change programs, can build sustainable markets for water treatment products that are affordable and accessible for those who need them the most.



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