

# Global Development Alliance Safe Drinking Water Alliance



**“Experiences in Haiti, Ethiopia, and Pakistan:  
Lessons for future water treatment programs”  
December 2008**





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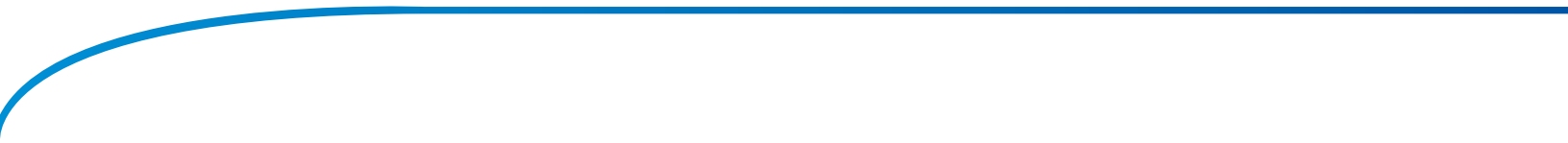
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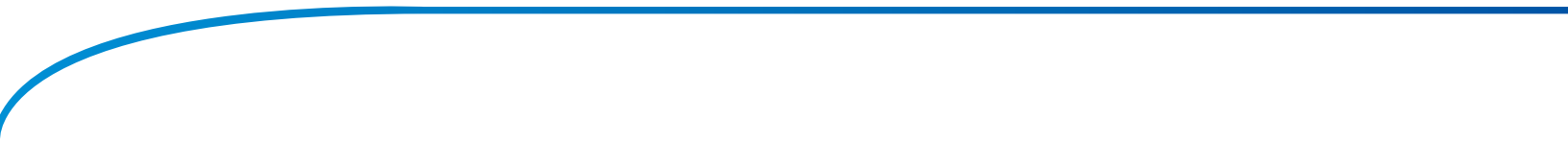
Finally, thanks to the people of Pakistan, Haiti, and Ethiopia and in-country organizations – HANDS, PIDE, HOPE, and SADA – who took part in the Safe Drinking Water Alliance program. We hope that the benefits intended by the program have continued well beyond the conclusion of program activities.

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## ABBREVIATIONS

ACF	:	Action Contre La Faim
BCC	:	Behavior Change Communication
BEP	:	Break Even Point
BLCF	:	Business Linkages Challenge Fund
CBDA	:	community-based distribution agents
CCP	:	Center for Communication Programs, Bloomberg School of Public Health, Johns Hopkins University
CD	:	compact disc
CDC	:	Centers for Disease Control and Prevention
CEA	:	cost-effectiveness analysis
CNV	:	Community Nutrition Volunteers
CTC	:	Community-based Therapeutic Care
ECHO	:	European Community Humanitarian aid Office
GDA	:	Global Development Alliance
HANDS	:	Health and Nutrition Development Society (Pakistani NGO)
HOPE	:	Health-Oriented Preventive Education (Pakistani NGO)
KTN	:	TV network broadcasting in Sindh province, Pakistan
MOH	:	Ministry of Health
NGO	:	Non-governmental organization
OTP	:	Outpatient Therapeutic Program
P&G	:	Proctor & Gamble
PIDE	:	Pakistan Institute for Development Economics
POU	:	Point of Use
PSI	:	Population Services International
RUTF	:	Ready-to-Use Therapeutic Food
SADA	:	Service and Development Agency (Haitian NGO)
SDWA	:	Safe Drinking Water Alliance
SNEP	:	Service National d'Eau Potable
SWC	:	Safe Water Council (Pakistan)
USAID	:	United States Agency for International Development
WHO	:	World Health Organization



## EXECUTIVE SUMMARY

The World Health Organization estimates that more than one billion people across the globe do not have access to safe and reliable drinking water. The morbidity and mortality resulting from water-related infections such as diarrheal disease are enormous, and exacts a particularly high burden among young children. Safe water, proper hand washing, and latrine use are key environmental interventions to reduce the prevalence of diarrhea. A variety of methods exist to treat drinking water at the point-of-use (POU), including boiling, using filters, chlorination, and combined methods like filtration and chlorination, or flocculation and chlorination. Even where households have access to one or several methods, research shows that worldwide, only a small percentage of them routinely and consistently treat their water.

To address some of the challenges created by lack of access to safe water, in 2004, the United States Agency for International Development's (USAID) Global Development Alliance (GDA) brought together Johns Hopkins Center for Communication Programs (CCP), Population Services International (PSI), CARE USA, and Procter & Gamble (P&G) to create the Safe Drinking Water Alliance (SDWA). The general goal of the Alliance was to test three marketing models to increase demand for water treatment and to identify the potential of P&G's PUR in each model as an alternative POU technology. PUR is a household-based water treatment product that combines disinfection with removal of dirt and other pollutants and transforms turbid contaminated water into clear, potable water. The three models tested by the SWDA included:

- (1) a commercial marketing model with full cost recovery in Pakistan;
- (2) a social marketing model where some promotional costs were subsidized in Haiti; and
- (3) an emergency relief model in Ethiopia.

In Pakistan and Haiti a combination of behavior change communication activities and PUR-branded messages and materials were disseminated to increase the demand for water treatment and to introduce PUR. In both countries, CCP led the behavior change campaigns, while in Haiti PSI handled the specific promotion and distribution of PUR. In Pakistan, P&G focused on creating demand for PUR. In Ethiopia, CARE staff working in the Community-Based Therapeutic program were fully in charge of introducing PUR and providing the motivation and information for its use.

In all three contexts SDWA partners also studied barriers and facilitators to sustained water treatment behaviors, as well as reactions to and use of PUR specifically. Findings have clear programmatic relevance, and add to the emerging literature on water treatment behavior and the adoption of new technologies, and particularly provide insights about feasible directions for PUR. We appreciate comments, feedback, and questions from readers.

## MAIN CONCLUSIONS AND PROGRAM RECOMMENDATIONS

Following is a summary of the conclusions and recommendations identified by the SDWA partners. They have been organized into three areas: PUR promotion, water treatment behavior, and program models.

### PUR promotion

- PUR communication strategies should capitalize on the power of PUR's visual effect not only during community group demonstrations but also — if developed properly — through TV and instructional videos. PUR should focus its promotional efforts in areas where water sources tend to be turbid and create a stronger visual effect that can be used to increase awareness of water quality.

- PUR promotion needs to provide solutions for the quantity of water that can be treated and the need for two buckets. One alternative for very poor communities like those in this study would be to provide the scissors and the buckets for free to households that want to use PUR. Another alternative would be to change the focus of the promotion from the individual to the community or a group of households. NGOs or existing community groups could evolve as micro-enterprises that could treat water in large quantities and supply it to consumers in smaller volumes to fit their needs.

### Water treatment behavior

- Creating the habit for a new behavior requires a long-term commitment, with continuous program support and presence in the field. Demand creation requires intervention at multiple levels; from policy and leaders to prioritize and maintain water treatment in their agenda, from civil society and the private sector to identify technologies and resources that can make household water treatment easy to practice, and from institutions like clinics and schools to consistently promote and model the behavior.
- Programs need to develop appealing and convincing messages outside the health perspective. They should continue to explore the role of social influence, attitudes, and perceived norms in adoption of water treatment and the synergy with other hygiene behaviors at the household level.
- Water treatment programs should identify and collaborate with trusted local NGOs, leaders, and other community-based groups. This will assist with awareness raising and normative change, and will provide additional means for promotion of the new behavior, and product distribution in remote communities.
- Programs should consider training and engaging product retailers to resolve doubts, provide positive feedback, and enhance motivation among potential consumers. Instructional videos, when feasible, could be distributed to retailers and NGOs to address frequently asked questions and enhance motivation.

### The Program Models

- Programs should explore past or existing POU promotional efforts to learn more about if and how the use of a water treatment product stimulated any interest and demand, and how familiar the population is with water treatment technologies. This will help devise feasible goals and level of effort needed.
- POU commercial and social marketing ventures need to have a long-term commitment to create sustained demand for POU products and implement communication campaigns that engage and reach different audiences at scale. In parallel, technology producers need to devise more appealing methods or more easy-to-use packaging and improve distribution.
- POU programs could learn about the sustainability of water treatment behavior by following up with households that had recently passed an emergency relief operation where water treatment was promoted.

The three models studied in this project (in Pakistan, Haiti, and Ethiopia) have provided considerable information about using PUR in poor contexts and in emergencies, and about water treatment behavior. There is still much more that needs to be learned about what makes water treatment a sustainable practice across regions and about water management and storage practices. This report is a small contribution to this effort.



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## INTRODUCTION AND BACKGROUND

The World Health Organization estimates that more than one billion people across the globe do not have access to safe and reliable drinking water. The morbidity and mortality resulting from water-related infections such as diarrheal disease is enormous, and exacts a particularly high burden among young children. Even in countries where the death rate from diarrhea has decreased substantially due to child survival interventions, such as the introduction of oral rehydration therapy, the prevalence of the illness has changed little if at all.<sup>1</sup> One of the effects on children of recurrent diarrhea episodes is a weakened health and nutritional status as well as poor childhood development. These outcomes result in higher death risks from a variety of childhood illnesses and in substantial losses in Disability Adjusted Life years.<sup>2</sup>

It has been demonstrated that safe water together with proper hand washing and latrine use are key environmental interventions to reduce the prevalence of diarrhea. A variety of methods exist to treat drinking water at the point-of-use (POU). These methods include boiling, using filters, chlorination, and combined methods like filtration and chlorination, or flocculation and chlorination. Skills and processes for each of these water treatment methods vary. Even where households have access to one or several methods, only a small percentage of households worldwide routinely and consistently treat their water.

### THE SAFE DRINKING WATER ALLIANCE

Addressing some of the challenges to improve access to potable water for those more in need requires devising models that can increase demand for safe water and can provide alternatives for POU water treatment that are affordable and meet peoples' lifestyles and preferences. Within the framework of the United States Agency for International Development's (USAID) Global Development Alliance (GDA), five organizations came together in 2004 to create the Safe Drinking Water Alliance (SDWA): USAID, Johns Hopkins Center for Communication Programs (CCP), Population Services International (PSI), CARE USA, and Procter & Gamble (P&G). The SDWA partners combined their distinct skills—in behavior change communication, social marketing, community participation, emergency relief, and private commercial marketing—to increase access to safe water in three selected countries and to assess the feasibility of three models for promoting water treatment.

### SDWA Goals and Objectives

The overall goal of the SDWA was to test three marketing models for increasing demand for water treatment so as to reduce diarrheal disease in vulnerable populations without access to safe water. In each model, the project examined the potential of P&G's PUR product, a flocculant and water disinfectant, as a point-of-use water treatment option and also studied barriers and facilitators to sustained water treatment behaviors. The three models tested included a sole commercial marketing model with full cost recovery in Pakistan, a social marketing model in Haiti where some promotional costs were subsidized, and an emergency relief model in Ethiopia. The SDWA project objectives were to:

1. Increase prevalence of sustained water treatment (including PUR) and safe storage practices at the household level.
2. Identify the most appropriate marketing and distribution models for water treatment technologies.
3. Understand how PUR works vis-à-vis other water treatment technologies.
4. Identify factors that impede or facilitate sustained water treatment behavior at the household level.

1 Environmental Health Project (June 1999) Preventing child diarrheal disease: Options for action USAID Bureau for Global Programs Field Support and Research Office of Health & Nutrition  
2 Richard L. Guerrant, Margaret Kosek, Aldo A. M. Lima, Breyette Lorntz and Helen L. Guyatt (2002) Updating the DALYs for diarrhoeal disease Research Update TRENDS in Parasitology Vol 18 No 5 May 2002

### The Product: PUR

PUR is a household-based water treatment product developed by Procter & Gamble that transforms turbid or contaminated water into clear, potable water.<sup>3</sup> PUR disinfects water, removes dirt and other pollutants, and is easy to transport and store. These characteristics make it ideal for use in remote areas and where source water is turbid or highly contaminated, such as river water, water from ponds, or from unprotected wells. A 4-gram sachet of PUR powder will treat 10 liters (2.5 gallons) of water through a dual process of flocculation and disinfection. The process of flocculation removes heavy metals and poisons, and the chlorine-based disinfection kills germs, microbes, and parasites. The chlorine residue in water prevents further recontamination for up to 48 hours. PUR comes in strips of 12 sachets, or 20 dozen to a case (240 sachets). Randomized controlled trials in both stable and distressed settings have shown that consistent household use of PUR significantly reduces the incidence of diarrhea.<sup>4,5</sup>

### PROGRAM ENVIRONMENTS & HIGHLIGHTS

Pakistan, Haiti, and Ethiopia were chosen because of their socioeconomic conditions and because of SDWA partner resources available in each country. In Pakistan, P&G had ongoing commercial operations to facilitate testing the commercial model. In Haiti, PSI had local operations and a strong social marketing distribution network that helped test the social marketing model. SDWA initially chose Sudan to test the potential of PUR in CARE's health relief efforts in refugee camps, however because of insurmountable problems in Sudan, the emergency relief model was ultimately tested in Ethiopia.

### The Commercial Marketing Model: PUR in Pakistan with P&G

Most people in Pakistan do not have access to clean, safe drinking water. Even in large urban centers safe water is limited. In Islamabad, the capital city, 60% of drinking water is not potable, and diarrhea is prevalent throughout the country.<sup>6</sup> Between 1990 and 1994, diarrhea caused 43.3% of post-neonatal deaths in Balochistan and North-West Frontier Province.<sup>7</sup> Data from the 1990-1991 Pakistan Demographic and Health Survey reported that diarrhea was the cause of 40% to 60% of deaths occurring in children under one year of age in Pakistan.<sup>8</sup> In Sindh province a recent survey found that 51% of children in rural areas had suffered a diarrheal episode in the two weeks prior to the interview.<sup>9</sup> Because of its diarrhea prevalence and chronic problems of water quality and quantity, Sindh was selected as the focus province for the water treatment and PUR promotion interventions in Pakistan.

As described more fully later in this report, P&G started marketing PUR in Pakistan in August, 2003 and ceased active marketing efforts in November, 2004. In mid-2004, SDWA launched the Pakistan Safe Water Council (SWC) to advocate for a safe drinking water agenda in Pakistan, including POU treatment at the household level. With support from CCP, SWC led a behavior change campaign to encourage POU water treatment. The campaign ran in parallel to the PUR marketing campaign, and included mass media and a community component that was conducted in collaboration with the Health and Nutrition Development Society organization (HANDS).

3 <http://www.pg.com/pghsi/safewater/index.html>

4 Crump J A et al (2005) Household based treatment of drinking water with flocculant-disinfectant for preventing diarrhoea in areas with turbid source water in rural western Kenya: cluster randomised controlled trial *Bmj* 331(7515) 478

5 Reller et al (2003) Flocculant-Disinfectant Drinking Water Treatment for Diarrhea Prevention in Rural Guatemala *Am J Trop Med Hyg* 69(4) 2003 pp 411-419

6 The Drinking Water Situation in Pakistan Dr Haroon Ibrahim M Jahangir Saima Aziz Khan Water Project The Network for Consumer Protection December 2003

7 Bulletin of the World Health Organization 2002

8 <http://www.measuredhs.com/pubs/pdf/FR29/09%20Chapter%209.pdf> (40% were cases assessed by a doctor or health care worker 19.5% were mother's own assessment)

9 Sha Syed M et al (2003) Prevalence and correlates of diarrhea *Indian Journal of Pediatrics* 70 3 207-211

## The Social Marketing Model: PUR in Haiti with PSI

In Haiti, lack of potable water is a chronic and widespread problem and a root cause of much of the morbidity, particularly among young children and those with compromised immune systems. Many Haitians – more than 50% both in urban and in rural areas – lack reliable access to potable water. Haiti has the highest rates of infant mortality, maternal mortality, and malnutrition of all countries in the Americas. Acute diarrheal disease is the worst health problem in children, and the second leading cause of death in the general population.<sup>10</sup> Only 11% of the Haitian population has access to water at home, 42% gets it from a public fountain, and more than 30% obtain their water from an unprotected source.<sup>11</sup> Almost all of the 18 major water sources supplying Port-au-Prince are polluted.<sup>12</sup> Only 0.4% of the population has access to a private toilet, 23.5% use shared latrines, and almost 40% have no latrine or designated space for defecation. No Haitian city has a public sewage system, and solid waste management is a serious health and environmental problem. Diarrheal disease prevalence among children aged 6-23 months ranges between 38-41%.<sup>13</sup>

In October 2004, PSI launched social marketing activities for PUR in Haiti. The social project was implemented nationally but focused on areas where the diarrheal disease burden was the highest. At the close of the project, PSI/Haiti had distributed more than one million sachets and had made the product available nationwide through the PSI distribution network, which included over 3000 sales outlets.

Alongside this marketing campaign, CCP launched a BCC campaign to increase demand for water treatment at the household level. CCP joined forces with SADA (Service and Development Agency), an NGO with strong partnerships with local grassroots organizations and an important primary health care provider in communities.

## The Emergency Model: PUR with CARE in Ethiopia & Haiti

In Ethiopia, only 31% of households have access to safe water sources, and only 18% have access to sanitation facilities.<sup>14</sup> Children are especially vulnerable: only 21% of all children and 13% of rural children have access to potable water. Diarrheal disease causes 24% of Ethiopia's mortality in children under five.<sup>15</sup> In Ethiopia, SDWA made PUR available to an Outpatient Therapeutic Program (OTP) run by CARE to alleviate severe malnutrition. SDWA sought to improve program participants' access to safe water, as well as to assess PUR's potential to provide safe water in relief effort operations and to understand program logistics in such contexts.

CARE's Community-based Therapeutic Care (CTC) program for severely malnourished children in East Hararghe began in March 2004. CARE used PUR to protect the malnourished child and other family members from contaminated drinking water. As discussed later in this report, CARE evaluated both the user acceptability of PUR and PUR's potential to reduce diarrheal morbidity in enrolled children and in other household members. When hurricane Jeanne hit Haiti in 2004, CARE visited the site to assess the logistics of using PUR as part of relief efforts.

## THIS REPORT

The conditions in each country, particularly in Haiti<sup>16</sup>, were a challenge for the implementation of the SWDA activities. These in-country challenges and the relatively short time of the program limited its potential. Nevertheless, the findings have clear program implications and add to the emerging literature on water treatment behavior and the adoption of new technologies, and particularly provide insights about feasible directions for PUR. We appreciate

10 PAHO Basic Health Indicator Data Base [http://www.paho.org/English/DD/AIS/cp\\_332.htm](http://www.paho.org/English/DD/AIS/cp_332.htm)

11 MSPP/PAHO Analyse de la Situation Sanitaire Haiti: 1999 Port-au-Prince Haiti

12 MSPP/PAHO Analyse de la Situation Sanitaire Haiti: 1999 Port-au-Prince Haiti

13 Haiti DHS (2007)

14 UNICEF (2007) Water Environment and Sanitation: Ethiopia Available: [http://www.unicef.org/ethiopia/reallives\\_389.html](http://www.unicef.org/ethiopia/reallives_389.html) Accessed September 10 2007

15 World Bank Africa Region Human Development & Ministry of Health Ethiopia (June 2004) Ethiopia: A country status report on health and poverty " Draft Report No 28963-ET Accessed September 19 2007 Available: <http://www.crdaethiopia.org/PolicyDocuments/CSR%20on%20Health%20and%20Poverty.pdf>

16 Social instability in 2004 due to the departure of President Jean-Bertrand Aristide hampered program activities

comments, feedback and questions from readers.

This report comprises three more sections. Section two describes the SWDA activities in each country. Section three includes the findings about people's perceptions and beliefs regarding water and water treatment behavior and technologies. It also describes the results of the program evaluation in Pakistan and Ethiopia, and the cost analysis for each of the three programs. Section four presents the conclusions reached by each of the partners regarding the use of PUR, program implementation, and behavior change.

## PROGRAM ACTIVITIES

Program activities for the commercial marketing model in Pakistan and for the social marketing model in Haiti combined a marketing campaign with a behavior change communication (BCC) campaign. The marketing campaign was led by P&G in Pakistan and by PSI in Haiti, and introduced PUR as a water treatment method for households to purify their drinking water. The BCC campaigns, led by the Safe Water Council and CCP in Pakistan and by CCP in Haiti, sought to create demand for water treatment and safe water storage at the household level, and to inform audiences about various water treatment methods. The marketing and BCC campaigns were planned to run in parallel, and disseminated complementary and differentiated messages using some shared visual elements so that viewers would associate the campaigns.

In Ethiopia, the program formed part of an ongoing emergency relief operation and examined the potential for PUR to provide safe drinking water in unstable conditions. In this model, the promotion of PUR was conceived as part of a humanitarian assistance program targeted to vulnerable groups in emergency situations.

This section of the report provides a general overview of the program activities in each country and the challenges faced. Research activities and findings are presented in the following sections.

### COMMERCIAL MARKETING MODEL IN PAKISTAN

#### Product Marketing and Distribution

The introduction of PUR in Pakistan was facilitated by the existing, mature commercial distribution network established by P&G in this country for its other commercial products such as Safeguard soap. Two phases comprised the promotional activities for the marketing of PUR, a pre-testing marketing phase and a large-scale product campaign.

#### Promotional Activities

The pre-testing “micro-sale” marketing phase of PUR used community-based promotion, or “experiential marketing,” aimed at women, teachers and schoolchildren, shopkeepers, and opinion leaders. Local women hosted product demonstrations, similar to the Tupperware sales model, to facilitate PUR’s socialization at the household level. Teachers were trained to educate schoolchildren on safe water and hygiene, and to introduce them to the superhero “PUR” Man to make fighting germs fun. The program reached out to shopkeepers and opinion-leaders in target communities to gain their support.



*Women watching a PUR demonstration*



*PUR promotion in schools with teachers and schoolchildren*



*PUR Man*

The large-scale product campaign used mass media, below the line materials, and point of purchase interventions. P&G launched PUR in urban Sindh with TV as the primary channel and radio advertising to support the TV campaign. Two TV ads promoted PUR. The first described germ theory and how to use PUR, and showed images from the Pakistani upper-middle class so as to create a “halo effect” that would give PUR status and encourage its use among “aspiring” audience members. The second ad showed a hospital ward full of children sick with diarrheal disease. This ad suggested that drinking water – even if it is clear – can make a person sick, and that PUR is the optimal method to produce safe, potable water. The large-scale commercial campaign ran from June to December, 2004.



PUR promotion

In parallel with the mass media, a specialized sales force conducted product demonstrations, painted storefronts, put up posters, and distributed the PUR product. The “Shop Branding Program” branded store façades with the PUR symbol and slogans in the same communities in which P&G was conducting product demonstrations. The product itself was exhibited on hangers in shop windows. These interventions were designed to build awareness and strengthen ties with store owners.



PUR promotion in shops – shop branding and storefronts

### Pricing, Sales, and Distribution

P&G reached 88% of the 25,433 stores in Sindh province, which were located in 41 cities and towns. The remaining 12%, or 3,156 stores located in 35 towns, were to be covered by local distributors. P&G achieved high distribution in stores because of its ability to leverage existing distributors and to spend heavily on a specialized sales force.

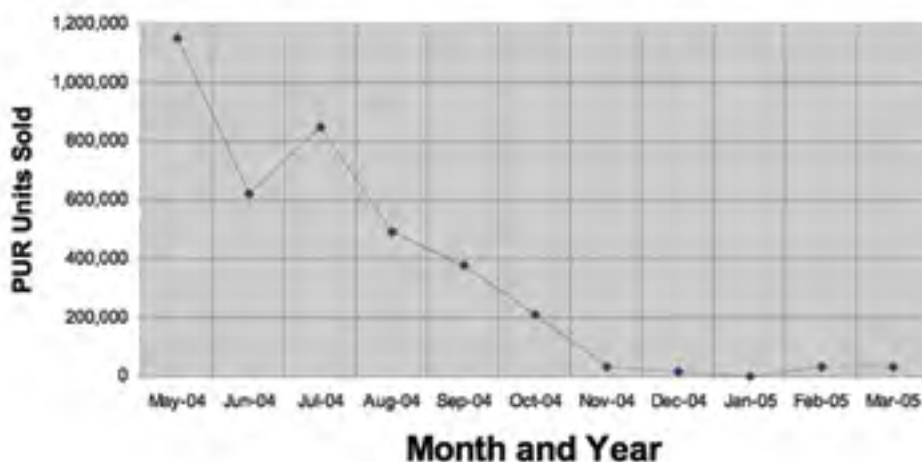


Every sachet of PUR was sold to distributors at Rs. 3.32, and then sold to the public at Rs. 5 (\$ 0.08 USD). The distribution chain thus had a high return of 50.6% over the cost of the product, or Rs.1.68 per unit sold.

P&G determined that one family would purchase an average of 2 sachets per week, totaling \$ 0.16 a week or \$0.02 per day per household. In Sindh province, 15.7% of people live below the poverty line,<sup>17</sup> and PUR was priced to be within their reach. With \$1.00/day as the threshold for extreme poverty, an expenditure of \$0.02 cents was equivalent to 2% of daily income, a level considered adequate for goods that provide a basic social service<sup>18</sup>.

During the large-scale campaign, the product achieved repeat purchase rates of about 5% over a period of six months, which P&G felt represented a core group of early adopters. However, demand for the product was lower than had been expected based on micro-market tests showing 40-60% repeat customers. When this level of repeat did not occur, new distribution quickly dropped and P&G decided to disband the sales force (see Graph 1, PUR Sales May 2004-March 2005).

**Graph 1 PUR Sales  
(Sachets sold May 2004-March 2005)**



### Behavior Change Communication for Water Treatment

The BCC campaign used mass media and advocacy to create an enabling environment for behavior change, and community mobilization and social dialogue to heighten the sustainability of these changes at the grassroots level.

#### Safe Water Council (Advocacy)

In parallel to P&G's commercial efforts to promote PUR, in May, 2004 the SDWA partners (P&G, PSI, and CCP) launched the Pakistan Safe Water Council (SWC), in partnership with the Pakistan Medical Association and HOPE Pakistan<sup>19</sup>. SWC's purpose was to advocate for a safe drinking water agenda in Pakistan, including POU treatment at the household level<sup>20</sup>. SWC was launched with the assistance of 200 people including high-

<sup>17</sup> <http://www.nation.com.pk/daily/apr-2004/6/6main/top6.asp>

<sup>18</sup> For example, a rule of thumb used in SOMARC and other social marketing programs is that the price of contraceptives sold should not exceed 2% of the user's daily available income to be considered as social interest products

<sup>19</sup> HOPE Health Oriented Preventive Education. See [http://www.hope-ngo.com/html/contact\\_f.html](http://www.hope-ngo.com/html/contact_f.html)

<sup>20</sup> SWC functions were to: (a) promote the benefits of safe water and increase knowledge on water treatment at the household level; (b) increase knowledge of the relation between unsafe water consumption and illness; (c) generate advocacy activities to put water treatment at the household level in the public agenda; and (d) endorse promotional, educational and informative activities intended to increase water treatment at the household level

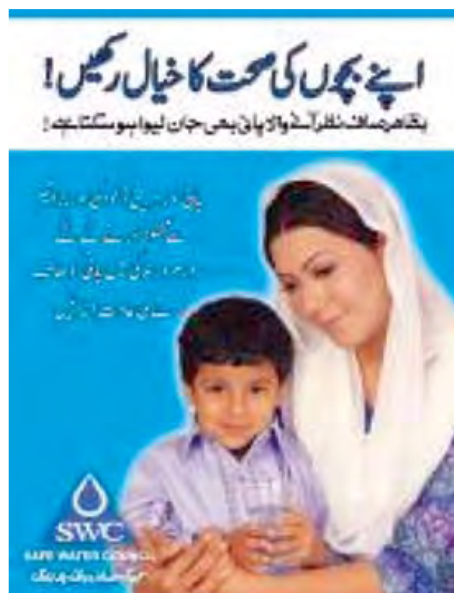
level government representatives such as the Senate Chairman Mr. Soomro and multilateral organizations like UNICEF and WHO. During the event, SWC members and affiliated organizations presented background information and the scientific basis for the proposed water treatment interventions. Several newspapers and other publications covered the launch, representing a circulation well over 4.5 million.

The SWC advocated to NGOs and Muslim scholars, but political endorsement did not always translate into a unified vision or message. Some organizations such as the Sustainable Development Policy Institute considered POU treatment a distraction from the responsibilities of government to ensure access to clean, safe water to all its citizens, a sentiment expressed in some communities as well. Other NGOs encouraged product vigilance and remained skeptical about PUR because, among other reasons, of its residual disinfection by-products.

Overall, the alliance between P&G (promoting the PUR brand) and the SWC (promoting water treatment behavior) was mutually beneficial. The SWC gained access to resources for its communication strategy that are usually reserved for large companies, including a seasoned creative team and access to media time. P&G benefited from the SWC's members' academic reputations, which facilitated formation of partnerships between the commercial and non-commercial sectors.

### Media

The launch of the Safe Water Council marked the start of the behavior change campaign. With technical assistance from CCP, the SWC designed its communication campaign in coordination with P&G's PUR campaign to create demand for safe drinking water and to offer a variety of water treatment options, including PUR. Data from 2003 showed that very few households practiced water treatment, although the majority knew something about treating water at home.<sup>21</sup> The behavior change campaign sought to encourage uptake of point of use (POU) water treatment through mass media, community mobilization, and dialogue. The campaign used TV spots, a TV serial drama, infonews, newspaper articles, and talk shows, and ran from June, 2004 until May, 2005.



Safe Water Council (SWC) promotional materials

<sup>21</sup> Drinking Water Pakistan: Habitat and Practices. AC Nielsen Pakistan, 2003.

### TV spots

Based on the situational analysis with communities (described in Section 3) SWC focused the BCC campaign on child care, gender, and male involvement. The campaign sought to stimulate dialogue and to support potential adopters to feel good about treating their water at home. Spots included:

- A lower-middle class, hard-working mother treats water for her child to protect him from disease. Her efforts pay off as her child improves in school and becomes more involved in sports. The ad also explains why children might get sick when water is not properly treated and offers information about available methods.
- A woman talks to other women about water and disease, and instructs her friends on different methods for treating water for disease prevention. The ad reflects dialogue in action and reinforces the positive aspects of assuming a leadership role in the community on water treatment issues. The ad ends with the protagonist's husband taking care of their daughter.
- A man purchases medication for his son who is sick with diarrhea. The husband in the previous ad comes to the pharmacy counter and engages in a dialogue with his good friend, who tells him why he needs medicine. The former advises his friend to start treating their water at home to prevent such illness. The spot highlights men's role in participating in decisions around safe water.

### Drama serial

CCP worked with KTN, a TV station based in Karachi that broadcasts in the Sindhi language. CCP and KTN worked to transform a planned TV serial into an entertainment-education program that would disseminate messages about the health benefits of water treatment and storage through the plots of thirteen episodes.<sup>22</sup> The serial was recorded in Sindhi and broadcasted in Sindh province. It was also reproduced on CD and given to NGOs such as HANDS (Health and Nutrition Development Society), which facilitated the community mobilization activities of the program. After the program ended, Greenstar/PSI received access to this material to introduce PUR through their community networks.

### Infonews

A total of four 2-3 minute information packages (Infonews) in TV news formats were produced and disseminated to stress water treatment and storage. Execution proved difficult however, as broadcasters did not air information as frequently as planned.

### Newspaper articles

The SWC also endorsed publication of four articles in local newspapers to support the public relations effort initiated with the SWC launching and to stimulate public dialogue about safe water. Articles were translated into Urdu, Sindhi, and English.



Pakistani newspaper articles

<sup>22</sup> The show was about Najmi a young female doctor who is studying and also working with the community. She stands against prejudice and oppression and advises community members on a variety of topics often related to childcare and water treatment.

**Talk shows**

Three talk shows were planned but ultimately only one was produced and broadcast. Medical doctors from the Pakistan Medical Association discussed safe water issues and answered questions from the public.

**Community Mobilization**

The behavior change campaign included a community mobilization component to increase participation in water-related issues, and to encourage normative change regarding water treatment and other hygiene practices. Local facilitators in each program community guided the community mobilization activities that ran from November, 2004 until March, 2005.

The community mobilization in each country comprised four phases: (a) background research (see Section 3); (b) return of results to the communities as a catalyst for dialogue around water; (c) community development of action plans on safe water; and (d) implementation and monitoring of action plans to address water quality.



*Community Mobilization*

To assure sustainability, the program sought to integrate community mobilization into existing long-term projects of local NGOs, however the limited time of the SWDA activities was a problem, and several organizations that were approached were unable to participate. HANDS was an NGO that had ongoing programs on hygiene, water, and sanitation, and that was able to add the community mobilization to its ongoing activities.



*Community Mobilization*

The mobilization activities were incorporated into the existing Women's and Men's Community Organizations, whose executive committees supported and followed up on the implementation of the project's action plans. The community mobilizers, who were also community members, worked with the executive committees to keep them updated and to organize activities, including home visits. The executive committees played an instrumental role in facilitating the home visits as well as other community activities. At the end of the program activities, the executive committee members helped organize the community Water Fair in cooperation with schools and health centers (see Appendix 1 for materials).

## SOCIAL MARKETING MODEL IN HAITI

In Haiti as in Pakistan, promotion of PUR was coordinated with water treatment behavior change activities. PSI/Haiti's promotional campaign sought to foster demand for the PUR brand by demonstrating its uniqueness and distinguishing it from other water treatment products like Dlonet.<sup>23</sup> PSI worked with CCP to design behavior change interventions that capitalized on parallel health promotion and marketing of PUR. To facilitate the audience's association of the two campaigns, they shared the same ad agency (LogoPlus). As in Pakistan, CCP led the BCC efforts and promoted water treatment and proper storage behaviors.

In Haiti, an advocacy entity such as the Safe Water Council was not necessary given the solid presence and long history of PSI and CCP in the country working on health issues. Instead, advocacy efforts focused on reaching parents and providers through journalists, radio, religious leaders, print materials, and community mobilization.

### Product Marketing and Distribution

The PUR campaign strategy was designed to have nationwide reach while emphasizing areas with the most diarrheal disease and areas prone to flooding, including Artibonite, North West, North East, and South East provinces.

#### *Promotional Activities*

PSI launched the PUR campaign in November, 2004. Television, printed materials, and radio spots aimed to reach urban areas while mobile cinema, radio sketches, product demonstrations, and community mobilization activities reached rural populations. A copy of the printed ads as well as the English translation of the Creole radio and TV ads are included in Appendix 2.



*PUR campaign photos*

<sup>23</sup> CDC's Safe Water System <http://www.cdc.gov/safewater/>

As in Pakistan, mothers of children under five were the primary audience of the campaign. Secondary audiences for the PUR campaign in Haiti included fathers, high school teachers and students, health care providers, and people living with HIV/AIDS. The central message was that PUR was a high-quality, affordable, and safe water system for the household that protects the entire family against diarrheal diseases and, due to their high vulnerability, is especially beneficial to children under five. The PUR campaign objectives were:

- To increase and reinforce knowledge that contaminated water is a cause of diarrhea.
- To increase understanding that piped water and clear water may be contaminated (clear water is not the same as clean water).
- To increase the knowledge that treating water for drinking and cooking will improve family health.
- To increase knowledge that the consistent use of PUR in particular can prevent diarrhea year round for the whole family.
- To ensure the correct preparation and use of PUR.

Interpersonal communication activities in rural areas sought to generate demand for PUR among the primary and secondary audiences. NGOs and community-based distribution agents (CBDAs) conducted product demonstrations both to foster a relationship with the brand and to illustrate correct usage.

### **Pricing and Sales**

PSI determined PUR's pricing structure based on pre-tests with consumers and with retailers. The goal was to make the product accessible to the general population while ensuring that it would also be cost recoverable. The final recommendation was for a wholesaler price of 1.9 Haitian gourdes (US\$0.053), a retail price of 2.25 Haitian gourdes (US\$0.068), and a consumer price of 3 Haitian gourdes (US\$0.086) per sachet.<sup>24</sup> Over the life of the project, 1,077,744 sachets of PUR were sold and distributed, including emergency distribution of 459,462 sachets to Haitian communities affected by flooding related to Hurricane Jeanne in September, 2004 and 110,900 sold to Venezuela for victims of flooding in February, 2005.

### **Distribution**

To maximize sales to households, PSI/Haiti developed a hybrid distribution system that incorporated the traditional distribution activities used for other PSI products with non-traditional distribution activities such as community-based sales and peer education. PUR was made available at drugstores and supermarkets, grocery stores, pharmacies, market stalls, clinics and health centers, and through door-to-door community-based sales.

To secure good coverage in even the most inaccessible areas of the country, PSI worked to establish a national network through CBDAs. These agents were coordinated through international and local NGOs who then trained community groups, women's groups, micro-credit organizations, missionaries, and other local groups to sell PUR to households, primarily in rural and hard-to-reach areas. CBDAs drew stocks of PUR from their local wholesalers on consignment and kept a sales commission.

#### **Traditional distribution system**

Under PSI/Haiti's traditional distribution system, products are intensively promoted to wholesalers who in turn promote the product through their retailer networks. The PSI sales force – comprised of a sales team, non-pharmaceutical wholesalers, pharmaceutical wholesalers, medical stores supplying public facilities, and retail outlets – used the independent distribution network already set up for other PSI products to distribute PUR.

#### **Non-traditional distribution network (NGOs)**

To reach potential customers outside of traditional commercial areas, PSI/Haiti assigned a project coordinator to develop non-traditional distribution networks to increase product availability among underserved communities.

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<sup>24</sup> One PuR sachet cleans 2.5 gallons or 10 liters of water

Haiti had many large, regional NGOs and many smaller local groups that were active in the public health field. PSI's rural outreach strategy targeted children in schools and distributed PUR through NGOs and through missionaries working throughout Haiti. The NGOs earned revenue from product sales, and their presence ensured continued supply and promotion of PUR in rural areas.

## Behavior Change Communication for Water Treatment

The BCC campaign was a multi-media effort with a strong community mobilization effort focused on mothers of children under 5 to increase demand for water treatment and encourage safe storage at the household level. The objectives of the campaign were to:

1. Increase the value community members gave to treated water and the prevention of waterborne diseases,
2. Increase knowledge of the importance of potable water and the prevention of waterborne diseases (specifically diarrhea),
3. Increase knowledge of available water treatment methods, and
4. Increase use and proper storage of treated water in the home.

The central concept of the BCC campaign was that safe water protects the health of the child and the family, thus reinforcing the PUR campaign objectives. The campaign logo and slogan also complemented messages in PSI's PUR campaign.



*Haiti BCC campaign*

Campaign messages were promoted through radio, posters, advocacy to journalists, interpersonal communication in routine community health worker activities, group discussion sessions in churches, schools and health centers; and other community mobilization activities. At the end of the program, these activities culminated with the Safe Water Fair which promoted safe water treatment through drama, song, and drawing competitions.



*Water Fair in Haiti*

### **Community Mobilization**

As in Pakistan, in Haiti CCP tried to integrate community mobilization into long-term programs to assure sustainability after the project ended. While several organizations were originally interested, the program time-frame was a limitation and SADA (Service and Development Agency) was the only organization able to join the program. The community-based promotional activities ran from August, 2004 until June, 2005, and focused on the peri-urban community of Source Matelas and on the rural community of Fond Baptiste, where SADA was already established as the primary health care provider. SADA had strong partnerships with local organizations, including women's groups and youth associations, churches, and schools.

Through SADA, water treatment committees were organized in both areas and they developed action plans for promoting water treatment methods. Committee representatives were recruited from community grassroots organizations, including community health workers, church groups, school representatives, and health service representatives. Assisted by SADA facilitators, the committees negotiated with PSI and Aquatabs suppliers for improved access to PUR and Aquatabs water treatment products.

Community mobilization activities included educational sessions with demonstrations, sketches and contests in schools, as well as sermons in churches. SADA's Community Health Agents played a key role in disseminating campaign messages through their regular health activities and group discussions. They recruited mothers' advocates to promote campaign messages through purification demonstrations and other promotional efforts. SADA gave the committee representatives T-shirts and badges to highlight their role in the community and support their community mobilization efforts. Community members refused to conduct mobilization activities until they received these materials, which they felt raised their credibility to promote such activities.

Community mobilization activities culminated with a Water Fair in each community. Winners of drawing and poetry contests received thematic prizes like water treatment products (Aquatabs, PUR, and JIF), T-Shirts, and posters.



*Campaign and community mobilization*

### **Media Interventions**

The formative research found that radio was the most important source of health information for women, so three national radio stations were selected to disseminate water messages: Radio Quiqueya, Radio Caraibes and Radio Vision 2002. National radio was selected over community radio because community radio was not available in the communities of Fond Baptiste and Source Metelas that were the focus of community mobilization. Three one-minute radio spots and a jingle promoted safe water treatment methods, types of water treatment methods, and the benefits of properly treated water. Radio journalists were encouraged to cover community events and increase the visibility of campaign interventions. (See communication materials and messages in Appendix 1.)



## EMERGENCY RELIEF MODEL IN ETHIOPIA

### PUR in Ethiopia

CARE Ethiopia's emergency Community-based Therapeutic Care (CTC) program began in March, 2004 in Bedeno and Kurfachele Woredas with plans to treat around 1,200 severely malnourished children. Enrolled children attended a weekly Outpatient Therapeutic Program (OTP) where they were weighed, measured, examined, and given nutritional supplements. Initially only rations of Plumpy'nut, a nutritional supplement, were distributed. However, by May, 2004, many more malnourished children were enrolling than had been anticipated, and CARE decided to provide a 50:50 ration mix of Plumpy'nut and BP100 because CARE's stock of Plumpy'nut would not be sufficient to treat the additional children. In June, 2004, CARE Ethiopia requested a supply of PUR from CARE Kenya to use with the BP100 supplement so as to reduce children's exposure to diarrheal pathogens.<sup>25</sup> The CTC program was to be expanded into Grawa Woreda in August and it was estimated that 360 children would be treated. In Grawa, plans were to only use BP100 with PUR, whereas in Bedeno and Kurfachele CARE would continue to use a combination of the Ready-to-Use Therapeutic Food (RUTF) and introduce PUR as an additional health measure.

PUR was introduced into Bedeno in August, 2004 where a combined 50:50 ration of the nutritional supplements Plumpy'nut and BP100 was used. The Grawa CTC program began in September with exclusive use of BP100 and PUR. PUR was distributed at the OTP clinics at the same time as the RUTF and in some cases other medication. Families attending weekly OTP clinics to receive aid, rations of RUTF or other medication, or to have children assessed, saw PUR demonstrations and received enough PUR sachets to provide 10 liters of treated drinking-water per day. The Community Nutrition Volunteers (CNV) provided follow-up support in the villages to ensure that caregivers were using PUR in the intended manner. Families living more than three hours from the clinic were given a two-week ration of PUR and RUTF. Besides product, each family received a ten-liter bucket, a 20-liter jerrycan, a one-liter plastic bottle, and a piece of gauze cloth to use as a filter during transfer of the treated water into the jerrycan. The one-liter bottle was intended to store treated water for the exclusive use of the enrolled child.

#### **Preparation and Training for PUR**

CARE began preparing to introduce PUR in July, 2004 and purchased jerrycans, buckets, and filter cloths. Educational messages and materials were translated into the local language and CARE conducted training and awareness-raising among stakeholders, including CARE's CTC staff, local Ministry of Health (MOH) promoters, and CNV.

PUR training sessions at the OTP clinics demonstrated each step of the treatment process and emphasized hygiene measures such as washing hands before treating water, and the use of a clean mixing implements and filter cloth. Households were advised to throw away or use the treated water for purposes other than drinking if they had stored it for more than 24 hours. Most women did not have watches, and trainers suggested that stirring should last for about the time it takes to prepare tea. Similarly, the 20 minute disinfection period was equated to the time it takes to prepare porridge. The training sessions lacked the opportunity for women to practice using PUR and did not provide visual training materials such as posters with images of the treatment steps, nor a take-home pictorial guide. However, as most families returned weekly, most had an opportunity to observe another training demonstration and ask questions.

<sup>25</sup> BP100 comes as a solid biscuit. For young children it is recommended to crumble BP100 into water to form a porridge which is easier for young children to eat

## UNDERSTANDING BEHAVIORS FOR SAFE WATER

In addition to testing the three models and the role of PUR in each country context, SDWA sought to identify factors associated with sustained water treatment behaviors:

- What *individual* factors (e.g. affordability, ease of use, trust, beliefs, and values) influence household water treatment and proper storage?
- What *household* factors and dynamics (e.g. decision-making within the family, gender roles) affect household water treatment behavior?
- What role does the *community* play in sustained water treatment and proper storage in the households (e.g., the role of leaders, social networking)?

Research activities in Haiti and in Pakistan included: (a) background research, (b) monitoring of community activities, and (c) end-of-project evaluation survey.<sup>26</sup> In Ethiopia, research activities consisted of a series of short surveys with beneficiaries and focus groups with beneficiaries and CARE's CTC staff. This section reports the results of the qualitative and quantitative research activities undertaken by SDWA partners in each country. Below we describe activities and findings in Haiti and Pakistan.

Background research in Haiti comprised focus group discussions and in-depth interviews with key informants.<sup>27</sup> In Pakistan it consisted of a situational analysis with participants from selected communities.<sup>28</sup> In both countries, facilitators shared results of the background research with communities at large to promote dialogue around water treatment and to develop collective action plans to improve the water quality in their homes.<sup>29</sup> To monitor program progress and to gain knowledge about water treatment behaviors, CCP trained local resource people in the use of participant observation techniques. These "community-monitors" acted as participant observers and documented collective activities throughout the duration of the project (August, 2004 to June, 2005 in Haiti, and November, 2004 to March, 2005 in Pakistan). The familiarity of these monitors and their continuous presence in the project communities resulted in frank and open communication with participants and in valid data for the program.

In addition, community mobilizers in Pakistan visited households regularly, as did locally trained community health agents in Haiti. Fifteen households were monitored over a three-month period in each of the communities selected in Haiti, and 60 households were interviewed in Sindh.<sup>30</sup>

## EXPLORING PEOPLE'S PERCEPTIONS AND MOTIVATIONS IN PAKISTAN AND HAITI

### Project Location Profiles

Two communities, one in a peri-urban area and one in a rural area, in both Haiti and Pakistan were selected for the program research. As mentioned before, people in Sindh province in Pakistan faced serious water pollution problems, including problems in the public tap water system. In Haiti, the peri-urban community located on the outskirts of Port of Prince, in the D'epartement de l'Ouest, and the rural community situated in a remote and hard-to-reach area in the same department,<sup>31</sup> relied on natural water sources.

<sup>26</sup> The evaluation survey in Haiti had to be cancelled because of political conditions that prevented the team from traveling to organize the field work

<sup>27</sup> Focus groups and in-depth interviews involved 45 females and 39 males from a peri-urban community and from a rural community. Interviews also included "consistent water treaters" (known in the literature as "positive deviants")

<sup>28</sup> Local facilitators convened 60 female and 40 male community members to analyze water and health-related issues and develop a situational analysis

<sup>29</sup> Part of the action plans described activities to promote sustained water-treatment at homes and tackle other related issues such as product availability (Haiti) and water source contamination (Pakistan)

<sup>30</sup> This information was later used to develop the survey questionnaire in Pakistan

<sup>31</sup> The activities carried out in the framework of this project targeted in particular: Ti Jarden (2 349 inhabitants) and Nan Borne (1 875 habitants) in Sources Matelas and Ti Place (1 500 habitants) and Ka pyè (1622 inhabitants) in Fond Baptiste. Those communities or localities were particularly at risk of water-borne disease and/or had recently experienced an epidemic (i.e. Ti Place: typhoid epidemic)

**Mulla Essa** is a peri-urban community of about 8,000 residents in Sindh province, Pakistan, where program interventions focused on a village of 1,355 people. Residents speak Balouchi and were of the C & D socio-economic classes; they had gas and electricity available. For the past 20 years the water supply has been piped in from a filtering plant, with well and bore water available for some areas. Residents of Mulla Essa were politically involved and active. The community of **Raza Mohammed**, also in Sindh province, is more rural, with a catchment area of 6,000 people and a village of 1,750 that was targeted for the intervention. Residents speak Sindhi and are of the D socio-economic class. Unlike Mulla Essa, in Raza Mohammed gas and electricity were not available. Within the last two years, some residents began receiving water from a filtration plant through pipelines; they used to get bore water through the same pipelines. Others have bore water. Residents of Raza Mohammed were less politically active than the peri-urban residents of Mulla Essa, and lived in extreme poverty.

**Source Matelas** in Commune of Cabaret, Département de l'Ouest is a peri-urban community with an overall population of 96,464 and a lot of migration. Two villages, of 2,349 and of 1,875, were targeted for the intervention. Residents speak Creole, were of the C and D socio-economic classes, and did not have gas and electricity service. They used natural sources of water, and one village had a public fountain. SADA has a health post in Source Matelas. The community of **Fond Baptiste**, in Commune of Arcahaie, also in Département de l'Ouest, had an overall population of 90,471; the program villages had around 1,500 and 1,622 people. Residents speak Creole and were of the D socio-economic class. Gas and electricity were not available, and the community recently underwent a typhoid epidemic. Access to water was from natural sources.



Women of Raza Mohammed



Group of community leaders of Raza Mohammed

The background research explored: water supply and availability; perceptions of the quality of drinking water and available water sources; risk perception regarding the consumption of contaminated water; water treatment and storage practices; and habits, values, and traditions related to water and water treatment practices. The following is a synthesis of the participants' views on these issues.

## Pakistan

### Mulla Essa (peri urban community)

Water from the well used to be sweet-tasting and there were few health problems, but water level has decreased with population growth. In the mid-eighties, the tap water filtered at the Pipee plant had a good taste and smell, but it too soon became insufficient. The water supply was supplemented by bore well, but it had a poor smell and taste. Both the well water and the bore water became salty, turbid, and smelly due to the decrease in the level of ground water. Cases of diarrhea, stomachache and hepatitis became recurrent in the community, yet there has been little accountability or action on the part of government or the community. In 2003 there was an outbreak of gastroenteritis and an emergency situation was declared. Tap and bore water are still the major sources of water. People use bore water when the supply of tap water runs low or is discontinued. People complained about the smell of tap water<sup>32</sup> and have reported this to the Nazim (local administrative authority), but no action has been taken so far, so people blame the government for having failed to provide the communities with safe drinking water.

<sup>32</sup> Community mobilizers explained that pipelines lie next to each other and since they are old and rusted they mix with the sewerage line

### **Raza Mohammed (rural community)**

Ten to fifteen years ago, water from the well was “sweet” and good to drink. The water level decreased because of “mafia” construction companies removing sand from the riverbanks. Water now runs 200 feet below the ground level, it needs to be pumped, and it is “salty.” Communities organized to denounce the situation. Bore well water became “salty” because of resource exploitation. About two years ago, tap water was introduced from the Pipree filter plant. This tap water was perceived as being good to drink, particularly in comparison to well or bore water, but this had been changing. Diarrhea has increased with tap water from the Pipree filtration plant, and there were reports of fungi, filthy material, and dead animals. People reported that either too little or too much chlorine is used. Tap water is available only one hour per day in Raza Mohammed and people stored it in tanks. They throw alum in their tanks to clean the water, which precipitates particles and visible dirt in the water. Some women use a piece of cloth that they place around the faucet as a water filter to help remove the dirt from the water they drink.

In both communities, the main health problems that participants related to contaminated water were diarrhea, vomiting, abdominal pain or colic, hepatitis, and kidney stones.<sup>33</sup>

Women tended to recognize the parents’ responsibility when it comes to assuring safe, treated water for children at home. Men, instead, tended to focus on the fact that “the government had failed to provide us with such a basic necessity as safe drinking water,” and stressed that “the situation would remain unchanged until and unless the government takes action.”

When asked what water-treatment methods they knew of, people in both the peri-urban and the rural community mentioned boiling, alum, liquid chlorine, and PUR. In Mulla Essa (peri-urban) participants also mentioned Dettol tablets. However, people recognized that none of those methods were used regularly at home. In Mulla Essa, participants explained that people treated their water only when their children get seriously ill and the doctors tell them to treat it. In Raza Mohammed, people acknowledged that none of the methods were currently being used at homes in their community.

### **Haiti**

As in Pakistan, in Haiti, participants reported low quality of their water sources but awareness of water treatment methods was higher. In Sources Matelas (peri-urban community), water is available year round. During the rainy season the natural water sources (i.e. springs, streams) become particularly dirty. People are then forced to walk long distances to collect water. There is a public fountain in the community under governmental control, but it is dirty and has frogs, insects, larvae, and worms.



© 2003 Greg S. Allgood, Courtesy of Photoshare

<sup>33</sup> This is the order in which these problems were presented in the observation reports/synthesis tables. It does not reflect an order of priority from the participants' point of view.

In the rural community of Fond Baptiste, people have access to natural water sources (i.e. springs). Water however is scarce all year round and more so during the dry season when people walk long distances and sometimes return home without water because the queues are too long. Those who can afford it buy water at 5 to 10 gourds (i.e. US \$ 0.12 – 0.25) per gallon. Water is so scarce that people fight over it, leading in some cases to violence and murders.

Both in the peri-urban and in the rural community people connected contaminated water with disease. They attributed a multiplicity of diseases and conditions to contaminated water, including the following:<sup>34</sup>

**Sources Matelas (peri-urban)**

- Diarrhea
- Typhoid
- Malaria
- Typhoid-malaria
- Eprente/Amibiaste (amebas)
- Intestinal parasites
- Cholera
- Fever
- Vaginal discharge

- Skin diseases
- Flu
- Abdominal pain
- Bad dental coloration
- Microbes
- Yellow fever
- Teeth discoloration
- Bloating
- Cephalaea

**Fond Baptiste (rural)**

- Typhoid
- Diarrhea
- Abdominal pain
- Vomiting
- Eprente/Amibiaste (amebas)
- Dehydration
- Intestinal parasites
- Malnutrition
- Skin problems
- Ascaris
- Vaginal infections
- Sterility
- Cancer
- Rubella
- Flu
- AIDS
- Hematurie

Participants felt that the health problems caused by contaminated water were serious and that the consequences of those diseases were also important and included, for instance, excessive expenditures, suffering, misery, and sometimes death.

Participants in Haiti reported knowing a larger number of methods compared to people in Pakistan. The following are water treatment methods people in each community reported knowing:

**Source Matelas (peri-urban)**

- Boiling
- Jif –liquid chlorine
- Chlorox –granulated chlorine
- Aquatabs
- Lemon juice
- Exposure to the sun
- Cactus
- Ice
- The “curage” –cleaning of sources
- Filter (PUR)

**Fond Baptiste (rural)**

- Boiling
- Jif, Dlonèt in Creole<sup>35</sup>
- Granulated chlorine
- Aquatabs
- Lemon juice, unpeeled lemon cut in two
- Exposure to the sun (Fern)<sup>36</sup>
- (Aquafine powder)
- (Raquette: cactus)
- (PUR)

Even though participants attributed serious diseases to contaminated water and were aware of various water-treatment methods, they also stated that most of the community members did not treat their water, and those who treated it, often did not do it regularly.

<sup>34</sup> This list does not reflect an order of priority or importance from the participants' point of view

<sup>35</sup> It is also one of the commercial names used by PSI to market liquid chlorine in Haiti

<sup>36</sup> Methods written in parenthesis were mentioned by participants during the community mobilization s discussions that took place after the formative research

## Collective Dialogue and Action on Safe Water

The second phase of community mobilization was to report back the results of the situational analysis and the formative research to the broader communities to foster dialogue around the findings and development of collective action plans to improve the quality of drinking water. In this dialogue phase, facilitators and barriers to sustained water treatment behavior and beliefs and preferences of water sources and water treatment were explored. During the sessions, the trained community monitors documented the discussions and reported back to project researchers for additional data analysis. The results of this dialogue and actions undertaken in each community are described here.



Collective dialogue in Pakistan

## Water Sources – Perceptions, Beliefs, and Preferences

### Pakistan

Ideally, good drinking water is “colorless, tasteless, and odorless.”  
The unpleasant smell of water is caused by a variety of things:

- Dead animals that are found in or close to the water treatment plants
- The mixing of sewage and pipeline waters
- Excessive use of chlorine

A general consensus among participants in Pakistan was that the unpleasant smell in water signals that the water is not good and that it may be harmful for their health. Tap water, despite the reported problems, is a valued source and was the only one among existing sources for which participants identified positive attributes. Tables 1 and 2, respectively, provide a list of the positive and negative attributes of each source as reported by participants in each community.

In Mulla Essa, three main water sources were mentioned: tap water, well, and bore. The water most commonly used for consumption was tap water. According to participants, well and bore waters were used occasionally, when the tap water was not available. Underground water (well, bore) is characteristically “salty.” The tap water gets smelly during the rainy season because of the overflow of sewerage water, which gets mixed with the supply of pipe drinking water (see Table 1). That is why, participants said, their tap water is not safe to drink (in particular during the rainy season).

**Table 1. Good and bad water sources (Mulla Essa)**

Source	Well water	Bore water	Tap water
<b>Characteristics</b>			
Positive	--	--	<ul style="list-style-type: none"> <li>- Is sweet, (“meetha” in local language)</li> <li>- Is transparent</li> <li>- Tastes good</li> </ul>
Negative	<ul style="list-style-type: none"> <li>- Foul smelling (smell of dead animals)</li> <li>- Salty</li> </ul>	<ul style="list-style-type: none"> <li>- Turbid</li> <li>- Salty (“khara” in local language)</li> <li>- Bad smelling</li> </ul>	<ul style="list-style-type: none"> <li>- Sometimes it smells bad (because sewage and pipeline waters get mixed during rainy season)</li> <li>- Tastes good but is unsafe to drink</li> </ul>

In Raza Mohammed (rural community), the two main types of water available were tap and bore water. Attributes described by participants clearly left bore as the least preferred water source (see Table 2). According to the community mobilizers, the negative attributes of tap water – filthy, low/high quantity of chlorine, unsafe – emerged during the community discussions, which suggests a change in perceptions emerging as community members got more involved in the discussion of safe water activities.

**Table 2. Good and bad water sources (Raza Mohammed)**

Source	Bore water	Tap water
<b>Characteristics</b>		
Positive		<ul style="list-style-type: none"> <li>- Clear</li> <li>- Sweet tasting</li> <li>- Safe to drink</li> </ul>
Negative	<ul style="list-style-type: none"> <li>- Bad smelling</li> <li>- Turbid</li> <li>- The water from these sources comes with sediments that start forming stones in the kidneys</li> <li>- It is “hard water,” meaning that it does not produce foam when used with soap or detergent, and therefore, is not good for consumption</li> <li>- Salty water</li> <li>- Unsafe for consumption</li> </ul>	<ul style="list-style-type: none"> <li>- If stored for 2 or 3 days, “worms start to appear in it”</li> <li>- It is filthy (it comes from a plant that is not clean/well maintained)</li> <li>- It has either too much or too little chlorine</li> <li>- Is not good/is unsafe for consumption</li> </ul>

Table 3 below summarizes the attributes of “good” and “bad” water as identified by participants in both communities.

**Table 3. Water sources: Synthesis of attributes**

Good water	Bad water
<ul style="list-style-type: none"> <li>• Sweet tasting (i.e. not salty): “meetha”</li> <li>• Transparent</li> <li>• Clean</li> <li>• Soft : The water that produces foam when used with soap is good for drinking, washing and cleaning</li> <li>• Without smell</li> </ul>	<ul style="list-style-type: none"> <li>• Salty: “khara”</li> <li>• Sweet water that has been recognized as unsafe to drink</li> <li>• Turbid</li> <li>• Filthy (with particles, dirt, etc.)</li> <li>• Hard (does not produce foam)</li> <li>• Bad/foul smell</li> </ul>

**Haiti**

Ideally, good drinking water is “transparent, fresh, and cold.”  
 People distinguished certain sources that they should avoid because they  
 “cause malaria, abdominal pain, and skin problems.”

Participants in both communities in Haiti felt that the best water comes from natural sources, which corresponds to their actual water source. As in Pakistan, people in Haiti value water that is colorless, that tastes good, and that is “glacée” (ice-cold).

Respondents discussed spring water, rain water, and well water. Spring water was described as light and fresh, crystal clear, has a good taste, and no color or smell. Some people said that spring water is like bottled water or “Culligan,” the product brand that “rich people drink.” For some people rainwater is good and refreshing, it has a “slight flavor and divine smell” and has no microbes, while for others it has a bitter taste, it is heavy, and although people use it, it is not reliable.

Some people in the peri-urban community of Source Matelas also talked about well water, which “is fresh but has microbes,” “would need to be treated,” and “although some people drink it, is mostly used for cooking and washing.” People in this community considered the best water source to be “Creole water” which connotes the pride of being Creole/Haitian. People judged whether water was good by its appearance: it is colorless and crystal clear. Good water does not smell, it tastes good, and is fresh and cold. Warm water was considered good when it was boiled water, which is given to babies and the sick. Even though participants said that good drinking water should be clean, they admit that the water they actually drink was “more or less clean.”

Bad water is “gluey” because “it has been stored for too long” and it is used for washing and cooking. People said that when people defecate close to the source or when latrines are built in their immediate surroundings, the water gets contaminated and is also bad water. Likewise, if women use a source to bathe when they are menstruating, or others use it to wash or bathe, the water is no longer good to drink.

In the rural community of Fond Baptiste, the preferred water was also from natural sources. The water that was considered good to drink is collected and covered in a reservoir and, therefore, not accessible to animals. The ideal water would be water that does not need to be treated. For some, that ideal water exists in their community,



while for others it is not similar to any of the sources to which they have access. The ideal water comes from a source that is close to their homes, abundant, and “calms our thirst quickly”—attributes that are in sharp contrast to the water scarcity that characterizes the zone. Table 4 summarizes attributes that distinguish good from bad drinking water.

*Table 4. Water sources: Synthesis of attributes given to water (Haiti).*

Good water	Bad water
<ul style="list-style-type: none"> <li>• Natural, or “Creole water”</li> <li>• Colorless</li> <li>• “Crystal clear,” beautiful, fresh, clean, clear or “white,”</li> <li>• No smell</li> <li>• Tastes good</li> <li>• Not accessible to animals</li> <li>• Ice cold - “glacee”</li> <li>• Accessible to home</li> <li>• Abundant</li> <li>• Not stagnant</li> <li>• “Quenches our thirst quickly”</li> <li>• Similar to the bottled water “that the rich drink”</li> <li>• Passed international tests (referring to water treated with Aquatabs)</li> <li>• Has no microbes</li> </ul>	<ul style="list-style-type: none"> <li>• Dirty, not clear, turbid</li> <li>• Contains microbes (which people can see), insects (roaches), and debris</li> <li>• Tastes like soil</li> <li>• Taste of calcareous layer. Fluoride contained in sources close to limestone mine.</li> <li>• “Gluey” because “it has been stored for too long”</li> <li>• “24 hours have gone by and therefore it is no longer good”</li> <li>• Close to defecation/latrines</li> <li>• Others use it to bathe</li> <li>• Not covered, exposed to animals</li> <li>• “Gets dirty during the day because too many people use it” – therefore effort to collect water late at night.</li> </ul>

**Water Treatment – Perceptions, Beliefs, and Preferences**

**Pakistan**

**Boiling** is by far people’s preferred method. It is natural (no chemical agent is used), in comparison to Dettol and PUR which contain chemicals. People trust boiling and are suspicious of chemical additives or products. Although boiling and Alum crystals are regarded as traditional methods, boiling is more widely accepted than Alum crystals, especially in the peri-urban community.

As found in the background research phase, the discussion about specific attributes of water treatment methods revealed that participants in the Pakistani communities had scant knowledge and access to treatment products other than boiling.

**Boiling.**

Boiling was perceived as an effective traditional method. Knowledge of the benefits of boiling had been handed down from generation to generation. People also trusted this method because it did not require the addition of any chemical. Knowledgeable, trustworthy people in the community, such as doctors, health providers/workers, the elderly and sometimes teachers, advised people to boil their water. People tended to boil water when someone in the family was sick rather than for preventive purposes. People also seemed to believe that boiled water has

curative properties (e.g. can kill germs inside the human body).

**Filter.**

The “filter” most commonly used consists of a piece of cloth that is tied around the faucet to filter particles and dirt in the water. Water filtered in this way is “cleaner” to the extent that those particles are removed.

**Alum crystals.**

Those who store water in excavated tanks in the rural community (Raza Mohammed) use Alum crystals to help precipitate the particles and dirt contained in the water. The use of Alum crystals was also regarded as a traditional method, but it was not as widely accepted as boiled water. The use of Alum crystals seemed to be regarded as “outdated,” especially in the peri-urban community (Mulla Essa).

**Dettol tablets.**

Dettol tablets were familiar products for people and relatively accessible in the peri-urban community. However, with minimal access to communication media, the product was not widely known in the rural community. Some of those who have access to media recalled the Dettol ads, especially its jingle. People were suspicious of chemicals and were reluctant to use chlorine-based or other products to treat their water. Specific perceptions about liquid chlorine did not come out during the discussions. However, from peoples’ comments on the water treatment process at the filtration plant, they said that the smell of chlorine in the water indicates that “too much product has been used” and, therefore, it is no longer safe to drink.

**PUR.**

Only one person from the discussion groups in the peri-urban community had tried PUR once and decided not to use it anymore because her children did not like its taste. According to the community mobilizers’ accounts, people were in general suspicious of chemical products and some believed that such water treatment products were perhaps being used to control the birth rate in the country.

**Haiti**

Both in the peri-urban and rural communities in Haiti, the preferred types of water are spring water and water treated with lemon, followed by boiling and using Aquatabs in the peri-urban community. Spring water and lemon juice are tasty and natural. There is no danger of overdose when using lemon for water treatment.

As in Pakistan, in Haiti, people preferred what they considered “natural” methods of water treatment, like lemon or boiling, and use of Aquatabs. People were less enthusiastic about chlorine-treated water, because of perceived risk and taste. When discussing water treatment, people in general referred to simple and natural methods/products to improve their water: “The source was dirty but we let it stand so that it became clean.” “It tasted like soil, but we put lemon in it and we drink it.”

**Lemon.**

Both in the peri-urban and the rural communities, people are inclined to choose lemon as their favorite water treatment method. Lemon is regarded as effective and safe. Several community members explained that, apart from the fact that it kills and helps precipitate microbes, the water treated with lemon has a good taste—which participants highly valued. Its slight green color is an indication that lemon has been used to treat the water. Participants in the rural community pointed out that they prefer this method over Jif (liquid chlorine) because they can use the wrong dosage of chlorine by mistake (which could be, in their view, fatal), whereas when they use lemon they don’t have this concern.

**Boiled water and Aquatabs.**

Two other types of treated water that were described with only positive attributes in the peri-urban community were boiled water and water treated with Aquatabs. Boiled water is warm, which seems desirable for babies and people who are ill. It kills and prevents the survival of microbes and is white (which in this context means “transparent”). The water treated with Aquatabs was considered good and easy to use: “many people use it,” “there is no problem with it.” Some people collect water that they treat with Aquatabs and sell it by the gallon.

Boiled water is viewed in the same positive light in the rural community, particularly for its benefits for babies and killing microbes. The need for wood is a disadvantage, however, as it is both difficult to find and to afford in the community. Likewise, Aquatabs are hard to find in the rural community.

**Chlorinated water.**

Chlorinated water was regarded as good in the peri-urban community “depending on the dosage used.” But “the water tastes like chlorine,” which is perceived to cause health problems if it exceeds the recommended dose. In the rural community, people said that Chlorox or Jif were better than other products because they were easier to obtain (i.e. through SADA). Some women trusted the method and made the analogy that “the same way it cleans clothes, it also can kill microbes.” In the rural community however, chlorinated water was viewed as potentially “harmful for the intestines.” There were rumors that it was dangerous and that they heard on the radio that if they use too much chlorine, they can get sick and die.

**PUR.**

People in both communities were impressed by the way PUR removes “dirt,” but not everyone trusted it because it is a new product and it contains chemicals. People regarded PUR as an effective method, but considered that it was time-consuming and required too much effort.

**Sun exposure.**

Some people in the rural community knew that exposing water to the sun can kill microbes, but it seems that that method was rarely used. It was noted that people exposed to the sun the bathing water of people who suffer from malaria to disinfect it.

**Attitudes and Practices toward Water Treatment – Facilitators and Barriers to Change**

Facilitators and barriers to water treatment comprised a variety of factors from individual characteristics to attributes of the product to social and economic factors. What follows is a brief description of the findings for the communities studied in each country.

**Facilitators**

Facilitators of water treatment behaviors include:

- Familiarity with water treatment from experience in epidemics
- Recognized need for treating water
- Ease of use and trust in the technology
- Recommendation from trusted sources
- Community groups and networks

**Awareness, previous knowledge, and experience**

**Pakistan:** Women in particular recognized the need to adopt water-treatment practices at home given the government’s failure to provide them with clean water. However, people had little knowledge of water-treatment products and methods and this created doubts about their safety.

**Haiti:** People in Haiti had been exposed to repeated epidemics of water-borne diseases and, concomitantly, to educational programs that have promoted POU water treatment. Therefore they knew various water-treatment products, were aware of the importance of treating water, associated contaminated water with a variety of diseases, and were aware of the severity of some of them.

### Perceived risk

**Pakistan:** Although people were not always aware of the real contamination of their water sources – believing that their tap water was clean enough to drink, for example - they were very aware of the risks that they take when they or their children drink contaminated or dirty water.<sup>37</sup> People’s awareness of these risks helped mobilize the communities around water treatment and led some people to adopt water treatment practices (mainly boiling).

**Haiti:** Both in the rural and in the peri-urban communities, people were aware of the risks and consequences of drinking “dirty” water. Those who had been seriously ill or who had seen others get sick or die during epidemics were particularly receptive to water-treatment messages. In Petite Place (locality in the rural community), several families had started treating their water after epidemics that hit the area; “everyone would like their water to be treated because they are afraid of dying.”

### Affordability and Ease of Use

**Pakistan:** In Mulla Essa fuel was available and perceived as affordable; therefore more people mentioned boiling their water. Those who opted for boiling their water had large enough pots that facilitated the task.

**Haiti:** Some people, especially “consistent water treaters” from the peri-urban community, considered water treated with Aquatabs and sold by the gallon to be affordable: 5 gourds for 5 gallons. Many of those who treated their water preferred Aquatabs because one tablet of Aquatabs treats the exact amount of water contained in a “bouquite,” the container commonly used. Women who treated water more regularly stated that they would recommend Aquatabs or Jif to other people because those products were “easy to use.” Others said that they would recommend water sold by the gallon because it’s already treated (with Aquatabs). Those who liked Jif said it was easy to control the number of drops.

### Networking, community groups, and social influence

**Pakistan:** Existing community groups and strong social networks<sup>38</sup> facilitated water-treatment promotion. Community mobilizers used these resources to organize educational sessions on water treatment and address the community’s concerns.<sup>39</sup> Active participation of formal leaders in key water-related activities complemented this informal networking. People highly trust recommendations from authority figures such as the elderly, doctors or teachers. Several formal leaders recommended boiling as a safe and effective water-treatment method.<sup>40</sup> Alum was not being currently recommended by authority figures, and coincidentally, was perceived by some as an “outdated product.”

**Haiti:** Even those who mistrusted chemical water-treatment products, felt reassured when or if a product was recommended by physicians or “doctors.” “We can trust the [quality] of the water that we boil ourselves, but we cannot trust Jif because we don’t know it. However, we can trust it [Jif] because the doctors are there.” SADA, a credible source for the communities, encouraged them to use water treatment methods at their disposal to treat their water.

### Other Facilitating Factors in Haiti

#### Aspirations and social status

People aspire to a better life and the use of certain products may bring them closer to the attainment of a higher

37 They also tend to attribute to contaminated water all sorts of diseases and ailments including in one case hepatitis B

38 Strong social ties and networks joined communities with women often visiting other families in the afternoons and men convening at the hotel where they gathered to drink tea and play games. Community members brought problems to the Female and Male Community Organizations where they were discussed and addressed

39 They invited filtration plant employees to some of these sessions to discuss the plant and the dubious quality of their tap water

40 Conversely Mullahs and Imams warned people of the dangers of using products that contain chemicals

social status. Thus, for instance, a participant in the peri-urban community expressed his preference for Aquatabs by saying that “Aquatabs are for gentlemen.” Some people compared the taste of their preferred water (be it from a natural source or treated) to Culligan, which participants described as “the water that rich people drink.”

**Trust in the product**

People tended to trust a natural product (e.g. lemon) more than a chemical-based products (e.g. Jif, PUR). Aquatabs, however, were highly regarded and trusted by most people that knew the product. Some people felt reassured that Aquatabs have been—in the words of a member of the water committee—“tested” and people felt confident about their safety and effectiveness: “We trust Aquatabs more after the international tests,” some said.

**Product is natural and has good taste**

People preferred lemon because it is natural, has a good taste and there is no danger of overdose. In this context, a water-treatment product that is perceived as having these attributes would gain consumers’ acceptance more easily.

**Collective action**

A traditional and collective communal practice in Haiti, the “curage des sources” — collective effort to clean the community’s water, was used as a facilitator. Building on this ancient practice, community mobilization activities were developed and the project team integrated education and demonstration sessions into the “curage” activities. People, as a result, began to internalize the idea that cleaning the source was not sufficient, and that there was a need to treat the water before drinking it.

**Barriers**

Barriers to water treatment behaviors include:

- Low self-efficacy to prevent disease
- No perceived need
- Affordability
- Lack of dissemination of treatment technologies
- Dislike and mistrust of chemicals
- Perceived consequences of interrupting the practice

**Lack of external control, and collective and individual (self) efficacy**

**Pakistan:** Respondents felt little or no control over the factors that cause diarrheal illness.<sup>41</sup> People noted the overall poor hygiene conditions in their village as a source of disease: “There are a lot of animals and mosquitoes in the community [Mulla Essa].” Some respondents also felt that “life and death are in the Hands of Allah” and this view was a barrier to adopting disease-prevention practices. Quantitative survey results confirmed that people who believe that good health comes from God and not from what people do were less likely to regularly treat their water.

**Haiti:** Beliefs in supernatural powers shape people’s lives and undermine their sense of external control and self-efficacy. Goddesses dictate good and bad, they express themselves through Nature, control events, and affect turbidity of water sources. People with this worldview sense little external control and tended to believe that there is little they can do to transform their reality.<sup>42</sup> “We are concerned,” they said in the rural community, “but since we don’t have any other water, we must drink what we have.”

41 Community members believe that contaminated water is only one of the factors that contribute to diarrhea so that even if water is treated other causes of diarrhea and water-borne diseases will subsist  
42 Supernatural beliefs compounded with water scarcity and the acute and pervasive social and economic crisis reinforced people’s sense of powerlessness

### **Affordability**

**Pakistan:** Middle-class families in the communities earn 3,000-4,000 rupees per month. Few families earn more than 10,000 rupees per month. The poorest families live on meager daily salaries: men earn 100 rupees (less than \$2 US) per day as laborers. Boiling water requires spending additional money on fuel, as does purchasing water treatment products, which seemed difficult for large or poor families.<sup>43</sup>

**Haiti:** People stated that water treatment products were too expensive for them. Even those who intended to treat their water had to interrupt treatment for economic reasons. In the rural community, women said that “sometimes we buy water at 10 gourds for a 5 gallon container” – twice the price quoted in the peri-urban community. As in Pakistan, wood was hard to find and expensive in the rural community, so boiling was difficult for the poorest people.

### **No need to treat**

**Pakistan:** People in both communities considered that in general their tap water was good and therefore did not see the need to treat it. In Mulla Essa (peri-urban community) some women did not boil their water because their “water is good” and their family “does not get sick.” Likewise, men from the same community argued that elderly people had been drinking the same water for many years and they were still alive and healthy.

**Haiti:** People in the peri-urban community questioned the need to treat the water from natural sources because they have been using them for a long time without getting sick. People requested evidence and were skeptical about the need to treat water from all natural sources. People in the rural community felt that the water from some sources got dirty due to the rain, which implied that during the dry season the water was “clean” and, therefore, there was no need to treat it.

### **Fears**

**Pakistan:** The Pakistani Government has launched a campaign to encourage families to have only two children. At the time of the study some community members feared that the chemical products or substances that were promoted in their communities may be “contraceptives in disguise.” In addition, some Mullahs and Imams had spread the word in the communities that there was an international conspiracy to decimate the Muslim population in the world. Any foreign (chemical) substance therefore might easily be suspected.

**Haiti:** There were some rumors in the rural community that the use of chlorine could make people sick and even cause death. Radio messages that were broadcast to stress the importance of using the right amount of chlorine, and not leaving it in the reach of children, may have been misinterpreted to mean that chlorine was potentially dangerous or lethal and, therefore, should be avoided. To a lesser extent than in Pakistan, people were afraid of new products. Some participants expressed their doubts regarding whether PUR and Jif could cause infertility, soften the intestines, and ultimately kill people.

### **Lack of accurate, standardized and simple information**

**Pakistan:** People stressed the lack of accurate, standardized, and/or simple information to use treatment products correctly. They were not sure how long to boil water and felt that there is no standard procedure for the use of Alum. Some pointed out that the instructions for the use of PUR were complicated and not visual enough.

**Haiti:** In both communities, people had different information about how to use treatment methods (e.g. number of minutes required for boiling, number of drops of liquid chlorine to use, amount of granulated chlorine needed to prepare liquid chlorine). Some people found that the instructions to use PUR were complicated, and community monitors reported that some were unable to demonstrate correct use.

<sup>43</sup> The community mobilizers from Raza Mohammed voiced their frustration about people's expressed inability to buy wood to boil. They complained that people spend between 30 to 40 rupees per day on a traditional product that contains tobacco (Gudka) and that they chew and creates dependency. However, they pointed out that large families (i.e. more than 5 members) are in fact often unable to make ends meet.

### Old Habits

**Pakistan:** People recognized that their “old habits” prevented them from adopting water treatment as a regular practice in their homes.

**Haiti:** People in Haiti also recognized that they do not have the habit of treating their water. For instance, they say, people do not serve treated water during a “*coumbites*” – a communal job in which people are given food and drink in exchange for work on someone’s land.

### Other Barriers in Pakistan

#### Competing priorities

In the rural community, Raza Mohammed, poverty and unemployment were peoples’ main concerns. Satisfying basic needs, such as obtaining a daily supply of food for the family, seemed to diminish the perceived necessity to treat water.

#### Lack of support in household

Women, especially from Raza Mohammed (rural community), complained that their husbands didn’t help them with the household chores but rather spend a lot of time in the hotel, playing cards or other games with friends. This explains why, as a participant explained, if a man tells his wife to boil water, she may refuse to do it simply because it is an additional task for her.

#### Dislike of taste and smell

Bad taste, smell, and turbidity were signs that the water is not good to drink. The taste of water treated with PUR dissuaded some people from using it.<sup>44</sup> People in Haiti made far fewer references to taste as a barrier to use than in Pakistan, possibly because Haitians have more experience with chlorine-based products and have used them during epidemics of typhoid, cholera, and other water-borne diseases.

#### Lack of products and equipment

Some people wanted access to products locally, in community shops, but there was hardly any product available. Dettol was found sometimes in urban areas. PUR had been promoted but was pulled out of the market in November, 2004. People also lacked the necessary equipment (e.g. two containers for PUR, or a big pot to boil water for a large family), to treat water, particularly in the rural community.



*Treating water in Pakistan*

#### Lack of information and promotion

Some participants in the discussion groups remembered jingles and ads of Dettol tablets but few were able to recall basic product information. In the rural community that did not have access to mass media people had no information about this product.

<sup>44</sup> One woman whose husband had bought several sachets of PUR during a product demonstration explained that she discontinued its use because her child did not like the taste

### Other Barriers in Haiti

#### Perceived consequences of interrupting a new practice

Some people considered that they are better off not starting the practice rather than having to interrupt it: “If we start drinking treated water, we have to continue doing it; otherwise we will get sick.” People were concerned they do not always have access to or cannot afford water-treatment products.

#### Time cost and effort needed

People described that it takes too long for products or methods to “work” on the water.<sup>45</sup> It takes a long time to cool down boiled water, people said (rural community). In both communities, people felt that using PUR was also time-consuming and required too much effort.

#### Lack of external control

Some participants argued that a child may drink treated water at home and yet get sick with diarrhea from the untreated water he drinks elsewhere (at school or when he visits neighbors).<sup>46</sup>

## PUR Versus Other Water Treatment Technologies Preferences and Factors Explaining Use

PUR produced a visual effect that no other method had, but...

- It changed the taste of water
- The PUR process was perceived as complicated
- It wasn't perceived as natural

In Pakistan, the PUR campaign was perceived as “forcing” the product on people. The community mobilizers refused to stress PUR as the preferred water treatment method and refused to do product demonstrations. Some people perceived the P&G sales force, who demonstrated PUR, as “aggressive sellers.” Some people felt the campaign improperly discredited other methods, such as boiling, and positioned PUR as the only reliable method. Since boiling is a highly trusted method supported by local leaders and NGOs, the PUR campaign would have benefited from being endorsed and promoted by trusted NGOs. PUR also needed more time to be socialized among community members by such NGOs that could support the product as much or more than the “external” messages of a product campaign.<sup>47</sup> Despite these negative reactions, people appreciated the strong visual effect of PUR but were discouraged by the taste, and needed more time to become familiar with it.

### Seeing is Believing

**Pakistan:** The visual effect of residue removal in PUR was striking and surprising for people. While other products such as Alum were used to precipitate particles and residues in the water, the treatment process of PUR helped people see how dirty their water was. People in Pakistan said that the demonstrations of PUR helped them realize that their water was not as clean as they thought it was.

**Haiti:** In Haiti, the visual effect built credibility and desirability for the product. No other product known provided that visual effect. However, while some people equated those residues with “microbes” and felt reassured that PUR could clearly remove them, others remained skeptical and stated that the residue in the water was just the product (i.e. powder) itself that had settled in the bottom of the container.<sup>48</sup>

<sup>45</sup> Particularly when water sources are distant from home the weather is hot and people are thirsty they want to be able to drink the water immediately

<sup>46</sup> This is another reason why the “diarrhea-prevention” message has not been very successful in promoting water treatment

<sup>47</sup> We do not have similar information for Haiti. In Haiti the promotion of PUR was integrated into the activities of SADA who was a distributor of other PSI products. This may have facilitated the promotion of PUR without negative reactions from people. The limited timeframe of the commercial model was a reason for the perception that the sales force was “aggressive.”

<sup>48</sup> They did this by showing that they could get residue out of water that had already been treated with PUR



### Change in Taste – PUR vs. boiling and Aquatabs

**Pakistan:** People said that boiling changes the taste of water only slightly, and that their children and family get used to that taste easily. PUR in their opinion changed the taste of the water more drastically and their children didn't like it.

**Haiti:** Some people in Haiti said that PUR changed the taste of water. In contrast, they said that Aquatabs, for instance, did not change the taste of water.

### Difficulty Versus Ease of Use – PUR vs. boiling and Aquatabs

**Pakistan:** PUR was regarded as a difficult method to use since it required utensils that people often did not have at home (e.g. two 10-liter containers). In contrast, people had pots where they boiled water. Likewise, people mentioned that they have to buy PUR in stores that were far away, while they had the fuel (gas or wood) at home that was required for cooking or boiling water.

**Haiti:** One of the main disadvantages of PUR in comparison to other products was the perceived difficulty of its use. People found that the process was complicated: two people have to hold the piece of cloth to filter the water while a third pours it into a second container; "the sachet is difficult to tear," and since they don't have scissors, they were afraid of using their teeth and damaging them.<sup>49</sup> In addition, people did not have the two 10-liter containers, and some said they did not have the money to buy them. In contrast, they mentioned that one tablet of Aquatabs delivered the exact dose required to treat the water contained in a "gallon" which was the most common container in the communities.

### Unfamiliarity with Chemical-based vs. Natural Methods

**Pakistan:** Boiled water was perceived as a natural and trusted way of purifying water, and one that people have used for generations. PUR, in contrast, created suspicion and doubts because of its chemical content.

**Haiti:** In Haiti, people have a marked preference for natural water-treatment methods such as lemon. Although some people were afraid of using chlorine (particularly in the rural community), people did not express any fear about using Aquatabs. Some of them, however, did not trust PUR because "they are not known quantities" (meaning is unfamiliar). Some people in the communities needed time to verify that the new product was reliable and safe.<sup>50</sup>

## Those who Treat their Drinking Water

The term "positive deviant" is used in social science research to describe someone who, unlike his or her peers, performs a desirable behavior. In this research, a "positive deviant" treats water consistently. This section summarizes the most salient features of those, identified in each country, who treat their water. We define "consistent water treaters" as those who regularly purify their drinking water and "purposive water treaters" as those who treat their water on certain occasions or for certain purposes, but not all the time.

### Consistent Water Treaters ("Positive Deviants")

Consistent water treaters, treat water because

- They were influenced by others in their social context
- An event in the family triggered the practice
- They are convinced that treating water is more cost-effective than treating disease
- Males or husbands support water treatment

<sup>49</sup> It is important to note that the beauty of a person's lips and teeth are highly valued in Haiti

<sup>50</sup> Doctors and the external health promotion agents are in a good position to recommend the use of water-treatment products to the community members. They are trusted and regarded as knowledgeable

**Modeling behaviors and socialization**

Consistent water treaters in both countries learned the behavior from others whom they consider knowledgeable or sophisticated. For example, a daughter in Pakistan learned water treatment from watching her mother treat water. Someone in Haiti learned the importance of treating water while employed as a maid in an urban area. Change agents (i.e. community mobilizers in Pakistan, and facilitators and community monitors in Haiti) felt responsible for setting the example and thus adopted sustained water-treatment practice to gain credibility and to convince people of the benefits of treating water.

**Husband’s role**

Husbands play a key role in the decision to treat water in a sustained manner at home, as shown particularly in the communities studied in Haiti. Several of the consistent water treaters interviewed in Haiti were male heads of households. Male heads of households bought or provided money to buy the products and sometimes they bought bottled water. In Haiti, the family trusted the decision of the head of the household when he decided to introduce them to PUR in their home.

**Illness in the family**

In Haiti, all family members started drinking treated water in a consistent way after a family member (e.g. father, son) got seriously ill with a water-borne disease.

**Switching products—relative advantage of PUR**

A person in Haiti who had consistently bought water for a long time decided to start treating his water with PUR. It was more convenient to disinfect the (dirty) water from a pump that was close to his home than having to go to a shop to buy bottled water. In addition, using PUR saved resources for him and his family.

**Awareness of water-borne disease and associated costs**

Consistent water treaters are aware of diarrhea and other water-borne diseases that can result from untreated water and of the high cost of treating those illnesses. They are convinced of the benefits of treating their drinking water and are convinced that treating water is more cost-effective than treating disease. They also feel that, even if people tried to discourage them from treating their water, they would not change their practice. Some of them have tried to encourage others to treat their water.

**Purposive Treaters**

Purposive water treaters treat water

- For babies
- During the rainy season
- As a result of epidemics
- When someone is sick

Some women in Pakistan and Haiti said they boil water for their young children, generally two years old and younger. Others in Pakistan boil water during the rainy season because of the anticipated outbreaks of water-related diseases. Likewise, in Haiti some people said they treat their water when it rains because the water gets visibly dirty.

**In case of epidemics**

In Petite Place (rural community in Haiti), where people were severely hit by a typhoid epidemic, some have started to treat their water with chlorine products (i.e. granulated chlorine, JiF, dlo-net) distributed by SADA for free or at a very low cost. The members of the emergency committee formed during the epidemics also mentioned that they started treating their water.

### When someone is sick

Some people in both Pakistan and in Haiti reported that they treat water when someone in the family gets sick. In Pakistan, people seem to believe that boiled water has curative properties (e.g. can kill germs inside the human body).

## ASSESSING THE EFFECT OF THE COMMUNICATION CAMPAIGNS IN PAKISTAN

The Pakistan Institute for Development Economics (PIDE), with assistance from CCP, surveyed a representative sample of 1,500 low-income households between May and June, 2005 to assess the effect of the safe water program in the Sindh province. Researchers fielded the Pakistan Safe Water Survey 2005 at the end of the BCC activities and six months after P&G ended the promotional activities for PUR in November, 2004. The results thus reflect mid-term effects of the PUR campaign. Following are some of the key findings related to water treatment practices, experiences with PUR, and the effect of the overall safe water program on water treatment behavior.



*Pakistan survey interviewers*

The survey respondents were women with children 12 years or younger. Most women (63%) lived in rural areas and 85% had children who were five years old or younger. Respondents' average age was 32 and they had an average of five years of schooling. About half reported watching TV daily, while only 16% reported listening to a radio daily.

### Drinking Water: Sources, Availability, and Distance to Source

People reported using three main sources for their drinking water: private wells, private water supply, and in third place, a community tap. For urban residents, private water supply inside the house was the main source (58%), and private/tube wells (51%) were the main source for those in rural areas (see Table 3.A.1 in Appendix 2). Availability of water was limited in all survey areas but more critical among urban residents. About half (47%) of survey respondents in urban areas said their water became scarce during the year, and 39% of rural residents reported this problem. Distance to the source was not large in most of the cases. Most respondents (72%) indicated that it took them “no time” to travel to the source, get the water and come back. The median amount of time spent to get water was 15 minutes, and only 4% reported that it took them more than an hour to get their water.

### Water Practices: Water Storage and Treatment

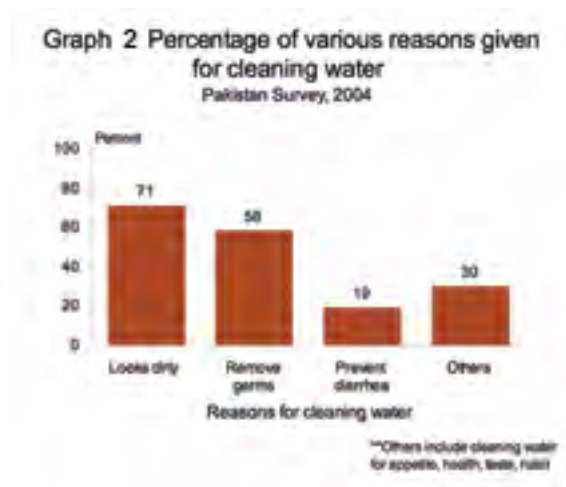
Half of the respondents stored their water for consumption. Most (70%) had never treated their drinking water, 23% reported treating their water in the week prior to the survey, and 7% reported treating more than a week ago. More urban residents had treated their water during the last week than rural residents (35% vs. 16%). A “cloth filter” was the most common method used, followed by boiling and alum (See Table A.2 in Appendix 2).



Water storage practices in Pakistan

For the analyses that follow, treating water in the last week was the measure used as the main outcome.

The majority of those who treated their water said they did so because “it looks dirty” or to “remove germs.” To prevent diarrhea was a reason mentioned by 19% of the respondents (see Graph 2).



## About PUR: Perceptions and Use

The survey asked all respondents whether or not they were current users of PUR, and about their use. The results showed that PUR was making a space for itself among people who had never treated their water and among those that used to boil (see Table A.4 in Appendix 2).

### Current Users

Almost half of current PUR users had not been using any other method before PUR, and a third used to boil their water. What current users of PUR liked most about the product was that water got clear and particles settled out, but some disliked the taste and the smell. Half the current users (52%) intended to continue using PUR as their home water treatment method, 8% were unsure and 38% said they might not continue to use it.

### Former Users

Among non-users of PUR, only 3% had tried the product before. Dislike of taste and smell were the main reasons why respondents stopped using PUR (see Table A.4 in Appendix 2). Most of these former users tried the

product for a week and about a fifth used it for more than a month. About a third said they might use it again, 16% were unsure, and 46% of former users said they did not think they would use it in the future. Former users said that the most important thing to change for them to use PUR regularly was to improve its taste.

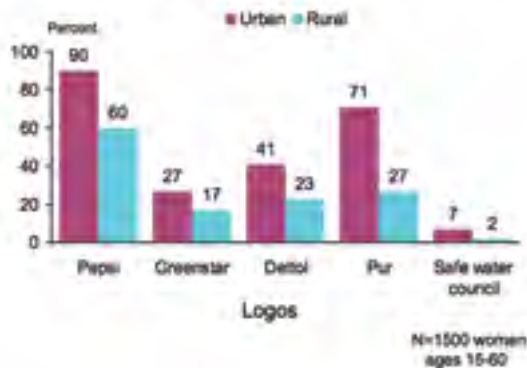
### Non-Users

The large-scale promotion of PUR from June-December 2004 focused on urban areas. Not surprisingly, rural non-users reported that the main reason they had not tried PUR was that they lacked information about it, and more than half did not know where to buy it. Among urban residents the main reasons for not using PUR were not having information about it (30%), no time to use it (22%) and being expensive (27%) (See Table A.5 in Appendix 2). When asked whether they would try the product in the future, 28% of all respondents said they were unsure; almost two in ten respondents (18%) said they would, and about half in urban (54%) and rural (47%) areas said they would probably not or definitely not use it. These results suggest that PUR needed to be promoted longer for people to get to know the product better, to become familiar with it, and to consider it an option for water treatment.

### Water Treatment Messages: Recall of Campaigns

Six months after the PUR campaign ended, people in Sindh had high recollection of the PUR brand, and logo recognition was also high. Among all the logos shown to urban residents, PUR was second in recognition just after the Pepsi logo. Recognition of the Dettol logo, another chlorine-based water treatment method that had been in the market longer than PUR, did not reach the level of recognition that PUR had (see Graph 3). The high recall of PUR indicated a high penetration among the Sindh households in a relatively short time.

Graph 3 Percentage of women recognizing different Logos by residence  
Pakistan Survey, 2004



Both the PUR and the behavior change campaigns promoted water treatment: 1) to keep you healthy; 2) so children won't get diarrhea; 3) to protect from illness; 4) to kill germs and bacteria; 5) because clean water may hide germs; and 6) "because water is life". People in Sindh had very good recall of these campaign messages.<sup>51</sup> Almost 90% of respondents in urban areas recalled at least one general water treatment message, and 60% did so in rural areas. In urban areas 72% of respondents recalled a specific message about PUR, while 29% of those from rural areas did so.<sup>52</sup> Notably, spontaneous recall of the PUR brand was as high as 50% among all respondents, while the recall of the Dettol brand was only 13%. Recall of specific messages from the Safe Water

<sup>51</sup> The survey elicited message recall as a spontaneous answer and as a prompted answer. To validate the prompted answers, a ringer message was added to the questionnaire. The percent of respondents that gave a positive response to this message was only 2%, which suggests an accurate recall and valid responses to prompted messages from survey respondents.

<sup>52</sup> To measure the specific recall of the PUR brand, a composite variable was created that included: 1) how to use PUR; 2) PUR cleans the water; 3) recollection of the PUR brand; and 4) recognition of the PUR logo when shown.

Council was lower than PUR message recall, 18% of urban respondents and 5% of rural respondents recalled seeing these messages (see Graph A.1 in Appendix 2).<sup>53</sup>

The overall campaign exposure variable used in the final analysis included all items mentioned above and household exposure to the program through content in schools, a focus of P&G activities in the Sindh province.<sup>54</sup> When all exposure venues are considered, results showed that only 27% of respondents were not exposed to any of the messages or logos, with the remaining 73% exposed to one or more messages, demonstrating the success of both campaigns (behavior change and PUR) in reaching the Sindh households. Later we present a regression analysis that shows the effect of this level of recall on water treatment behavior.

### The Predictors of Water Treatment Behavior: Ideational (Psychosocial) Variables

Health communication research and theory has shown that the likelihood of someone performing a behavior is higher if the person has sufficient knowledge about the behavior, has positive attitudes and confidence, and perceives or receives the support from relevant others in their community or group. In this part of the report, we analyze each of these variables separately and assess their effect on water treatment.

#### Knowledge of Treatment Methods

Overall, people in Sindh knew little about water treatment methods. Not even half of women in the sample mentioned boiling, which is widely known elsewhere. When spontaneous and aided responses were combined, 40% of respondents mentioned PUR as a method they knew to treat their water. This made PUR the 4th most known method, after the more traditional methods of boiling, cloth filter, and alum (see Table A.6 in Appendix 2).

#### Attitudes Toward Water Treatment

Respondents were asked about their agreement with a set of beliefs about water treatment that were derived from the situational analysis. Five of the 15 belief statements included in the survey clustered into a single variable measuring attitude towards water treatment.<sup>55</sup> Overall, respondents held few favorable attitudes toward treating water at home.

#### Social Influence

Social influence, measured as interpersonal communication with others, has been shown elsewhere to positively affect behavior. The survey found that interpersonal communication around water treatment was generally low, particularly in rural areas (see Table A.7 in Appendix 2). Even water treatment communication from health workers was low. Only 14% of respondents reported that health workers had recommended treating water at home.

#### Perceived Social Norm

The majority of respondents said that no one in their community (57%) or among their friends (59%) treated their water regularly.<sup>56</sup> Only about 5% responded that all/almost all of the people in their community or among their friends treated their water regularly. Such low perceived norm reinforces lack of the practice.

53 To assess recall of SWC-specific messages a variable was created that included recall of the phrase "message brought to you by the Safe Water Council" and recognition of the Safe Water Council logo when shown

54 The overall exposure measure included ten items that were combined into a single factor with an alpha reliability coefficient of 0.78

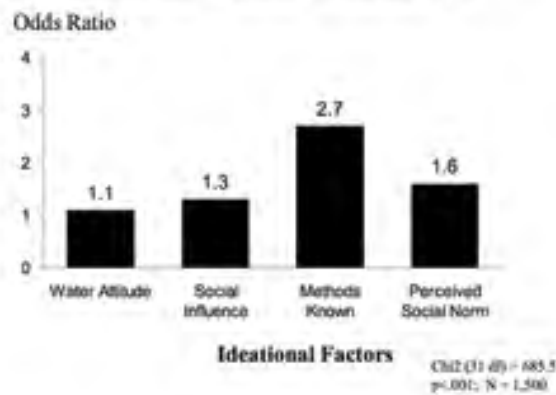
55 Beliefs included in this construct include two statements related to water attributes (clarity, sweetness), one related to water source (tap water perceived as safe), one related to internal control (trust in treated water), and one related to external control (good health comes from God)

56 The options were: all/almost all, more than half, half, less than half, very few, none

## Effect of Psychosocial Variables on Water Treatment

To assess the effect of the four psychosocial variables, described above, on water treatment behavior, a single index for each of them was created using a principal components factor analysis (see Table A.8 in Appendix 2). Graph 4 below shows the effect of each of these variables on water treatment after controlling for several confounding factors.<sup>57</sup> Knowledge of methods stands out as the most important variable affecting water treatment but all four remained statistically significant. Women who know more water treatment methods are 2.7 times as likely as those who do not have this knowledge to treat their water regularly; those who perceive a positive social norm for water treatment are 1.6 times more likely to treat their water. A similar interpretation applies for attitudes and social influence.

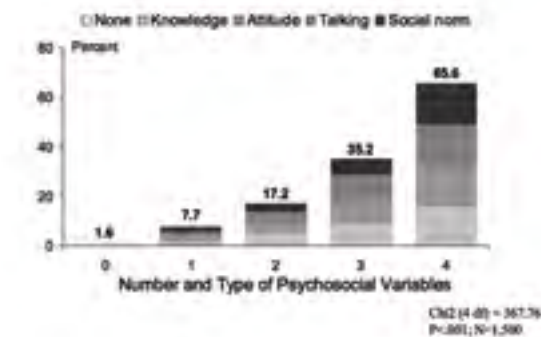
Graph 4 Adjusted odds ratio of ideational factors related to water treatment in Sindh, Pakistan, 2005



## Ideation and Behavior: A Dose Response Effect

The strength of these psychosocial variables on water treatment behavior is better appreciated when they are taken altogether in a single composite factor that we have labeled Ideation. Graph 5 shows a positive and monotonic association between the level of ideation<sup>58</sup> and water treatment. The greater the number of psychosocial variables that a person has, the higher the probability that she will treat her household’s water on a regular basis. For example, among those in the bottom of the ideation scale (none of the 4 variables; first bar in the figure), only 1.6% treat their water. Among those with any one of the four variables (second bar), 7.7% treat their water. Among those with all four (rightmost bar), 65.6% treat their water regularly. This proportion is three times the average for the entire sample (23%).

Graph 5 Percent water treatment by number and type of psychosocial variables that apply Pakistan Survey, 2004



<sup>57</sup> Control variables for this analysis included sociodemographic variables as well as water source and other household-related variables  
<sup>58</sup> To develop this composite a factor analysis of principal components was used. The Cronbach alpha measuring the reliability of this score was 0.72

Graph 4 also shows the relevance of each psychosocial variable in each of the four possible groups. For example, among those with one variable, attitude seemed more salient than the other three; very few talk to others, knowledge is also low as well as the perceived behavior of others (social norm). Among those with two variables, all of the four ideational elements increase but larger contributions come from knowledge and attitudes.

For those with three factors, “talking to others” adds significantly to the increase in water treatment. Lastly, among those with the four factors, the contribution of each is similar and perceived norm is as high as the other three.

These results suggest that behavior change programs aimed at increasing water treatment at the household level in Sindh should promote these four factors via messages disseminated through the mass media or other interpersonal channels and community-based interventions. In particular, water treatment programs in Sindh should make methods widely available and encourage talking to others about treating water.

### Handwashing and Other Hygiene Practices

To assess potential evidence of a “hygiene cluster,” the survey investigated hand washing with soap and other hygiene practices. Survey interviewers also observed respondents’ latrines, hand washing areas, and household surroundings. More than half of urban respondents reported that they washed their hands with soap after using the restroom (see Graph 6). However, only 17% of respondents washed their hands at three or more of the critical times;<sup>59</sup> 26% among urban residents and 11% among those in rural areas (figures not shown).



Frequencies obtained for other hygiene behaviors are shown in Table 5. The last column in the table shows the statistical association (without controlling for confounders) between each of these hygiene practices and water treatment behavior. Figures greater than one indicate a positive association and vice versa. Notably, the results provide preliminary evidence of a hygiene cluster as indicated by the significant correlation (p-values < 0.01) between household hygiene practices and water treatment behavior that deserves further exploration.

**Table 3 Hygiene practices and statistical association with water treatment; Sindh province, Pakistan**

Hygiene behavior	Percentage	Unadjusted Odds ratio*
Washes hands at 3+ of the cr t ca t mes	16.7	1.50
There s soap n wash ng area	57.0	1.80
D rty atr ne <sup>1</sup>	63.4	0.86
D rty househo d <sup>2</sup>	17.5	0.37
Washes uncooked vegetab es before eat ng	76.2	3.60

Source: CCP-PIDE Pak stan Water Survey’05

1/ Latrine has no cover; has feces and d rty paper around, and fl es.

2/ Feces n or around househo d and househo d ooks d rty.

\*a odds are s gn ficant at p<0.01 eve .

<sup>59</sup> Hand washing to prevent diarrhea is recommended at five critical times: before preparing meals before serving meals before eating after using the toilet/latrine and after cleaning children s bottoms



## Effect of Campaign Exposure on Water Treatment Behavior in Pakistan

Two types of results are presented in this section. First, we describe two regression models. Model 1 assesses the effect of exposure to the campaign on the ideation factor controlling for other confounding variables. Model 2 assesses the effect of this factor on water treatment, controlling for other confounding variables. Second, we estimate the effect of campaign exposure between intervention and control groups created from the survey data using “propensity score analysis.”

### Regression Analysis

The results of Model 1 show that exposure to the campaigns had a positive and statistically significant effect on the ideation factor after accounting for other potential confounders such as education, religion, and possession of a radio or TV (see Table 6). Results of Model 2 show the independent contribution of the ideational factor on water treatment after controlling for several potential confounders. The results are indicative of a positive effect of the campaigns on water treatment “working through” the four psychosocial variables that comprise the ideation factor (see Table 6).

**Table 6. Regression models**

Model 1 Regression of ideation on exposure to program campaigns and set of control variables  
 Model 2 Regression of treating water at home on ideation and set of control variables

Program and control variables	Model 1 Ideation		Model 2 Treat water	
	Descriptive Statistics <sup>†</sup>	Adjusted Beta. Coe. †	Adjusted Odds Ratio <sup>†</sup>	(95% CI)
<b>Exposure to water message</b>	27.5	0.31***	0.70	0.25-1.93
Recall campaign message				
<b>Psychosocial influence</b>	1.91		2.3***	1.19-1.27
Ideation towards treating water (mean)				
<b>Household hygiene environment</b>	57.0	0.09***	0.77	0.51-1.16
Have soap at hand washing area	17.5	---	0.50	0.29-0.85
Dirty household	0.9	0.06*	0.70***	0.59-0.83
Dirty Latrine (mean) <sup>‡</sup>	19.9	0.03	0.86	0.53-1.39
Have a closed pit latrine	45.7	0.09**	---	---
Have a regular Latrine				
<b>Water source, perceived water quality, collection, storage, cost</b>	31.3	0.15***	3.01***	1.98-4.58
Piped water	9.7	0.07***	2.47***	1.47-4.16
Other source of water (river, pond, etc)	4.0	0.15***	0.75***	0.66-0.85
Perceived water quality (mean) <sup>£</sup>	41.7	0.10***	1.56***	1.09-2.22
Water has become scarce	19.1	0.020	1.64	0.98-2.72
Less than one hour required to obtain water	9.5	0.07**	1.79*	1.01-3.17
2-5 hours required to obtain water	54.1	0.13***	1.48*	1.01-2.17
Store water at household	27.4	0.01	1.00	1.00-1.00
Cost of water supply (mean) <sup>§</sup>				
<b>Sociodemographic</b>	31.9	-0.03	1.01	0.99-1.04
Age (mean)	5.3	0.10***	---	---
Respondent's years of schooling (mean)	1.8	-0.04	0.97	0.85-1.10
Number of under 5 children in the household (mean)	1.9	-0.03	1.38*	1.05-1.80
Number of women in household (mean)	93.4		0.61	
Religion (reference is Islam)	1.4	---	4.66***	0.18-2.00
Christianity	5.2	---	---	2.43-8.94
Hinduism	14.4	0.03	1.71	
Occupation (reference is others)				
Piece worker	14.4	---	---	0.92-3.17
Regular job	31.1	0.03	1.71	1.28-4.71
Employer	21.1	0.07*	2.46**	1.09-3.72
Group participation (reference is none)	33.4	0.09*	2.02*	
Religious	59.7			0.44-1.07
Mothers group	21.4	0.03	0.68	0.17-1.04
Health/water sanitation group	4.3	0.02	0.42	0.15-2.10
others	1.6	0.01	0.56	0.51-1.52
Household has cable TV	13.1	0.11***	0.88	0.69-1.56
<b>Exposed to Dettol message</b>	26.7	-0.05*	1.04	0.47-1.09
<b>Have attended group meeting about water cleaning</b>	29.9	-0.01	0.72	0.50-3.00
	3.0	0.07***	1.22	
	Sample Size	1500	Sample Size	1500
	Goodness of fit	42.05	Goodness of fit	680.78
	(27)		Chi <sup>2</sup> (29)	
	Prob>	0.000	Prob >	0.000
	Adjusted R <sup>2</sup>	0.4354	Chi <sup>2</sup>	
			Pseudo R <sup>2</sup>	0.4177

† Descriptive Statistics are percentages except where indicated otherwise

‡ \*\*\* p<0.001 \*\* p<0.01 \* p<0.05

£ Psychosocial influence includes 4 factors, scores from 0 to 4, where 0 is none and 4 is maximum number

¥ Ranges from 0 to 4, where 0 indicates neat latrine and 4 dirtiest

£ Ranges from 1 to 5, where 1 is very bad and 5 is very good perceived water quality

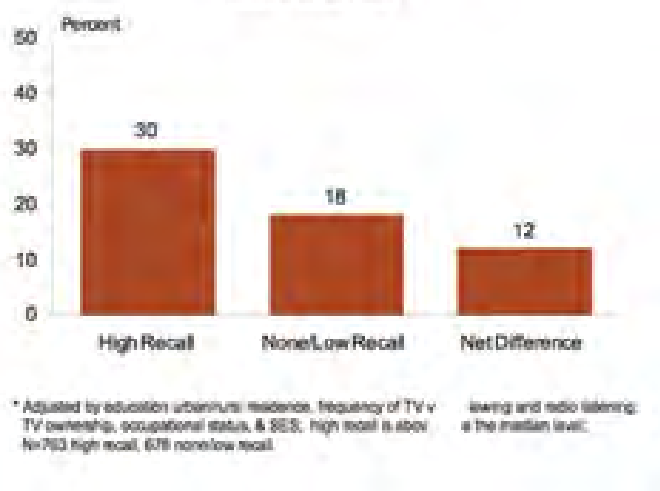
§ Ranges from 0 to 4000, about 49% of respondents reported no cost of their water supply

### Propensity Score Analysis

The direct effect of the communication campaigns computed using propensity score analysis showed a 50% difference in water treatment behavior between those with no or a low level of recall and those with a high level of recall. This 50% translates to 30% treating their water among those with high recall compared to 18% among those with none/low recall of the campaign messages (see Graph 7).

Results from the two regression models and the propensity score analysis provide evidence of the positive effect of the communication campaigns on water treatment behavior and on psychosocial variables related to water treatment in Sindh. Although water treatment levels are still low, these gains are relevant given that the communication activities were in the field less than a year.

**Graph 7 Percent treating water by level of recall of water promotion messages adjusted by propensity score analysis\***



## RESULTS OF THE ASSESSMENT IN ETHIOPIA AND IN HAITI

This section describes the results of the assessment of the use of PUR in the Community-based Therapeutic Care (CTC) program in Ethiopia, and in areas affected by Hurricane Jeanne, which hit Haiti in September, 2004.

### CARE’s Assessment of PUR in Ethiopia

CARE identified two main research issues for PUR’s use in emergency response to severe malnutrition: Would users accept treated water and treat it correctly? Would children receiving nutritional supplements and water treated with PUR suffer less diarrhea than children receiving only nutritional supplements?

To investigate these issues, CARE prepared a monitoring protocol which included a baseline survey, weekly follow-up surveys, water quality testing, focus group evaluation and a review workshop with CTC staff. The baseline survey included a non-random, quota sample of 50 households from Bedeno and 50 from Grawa that were surveyed as children enrolled for treatment.<sup>60</sup> The second stage involved weekly follow-up surveys of the same households, carried out over four consecutive weeks. The third stage of monitoring assessed the households' overall opinion of PUR and whether it had been used correctly.<sup>61</sup> Finally, a mini-workshop was held with the CTC staff to assess the experience from CARE's perspective.

### *User Acceptability of PUR*

Through observation of household demonstrations of the use of PUR, researchers concluded that women had no difficulty in following the correct steps in the treatment process. They did not need any help from the CTC staff in completing the treatment, nor was there any pause or uncertainty in their actions. In the households visited, women stirred the water for at least five minutes as told during the trainings. All observed households were experienced users of PUR, and possibly new users would have needed some additional support per comments recorded by trainers in Grawa.

CTC program staff raised several concerns about PUR. They were concerned that neither the sachets nor boxes of PUR provided any information on possible side effects. Furthermore, the PUR obtained for the program had been intended for use in Latin America, so the instructions on the sachets were in Spanish. Also of concern, especially to MOH staff, was the expiration date on the sachets. The original expiration date printed on the sachets, December 31, 2003, had been covered with a label with an expiration date of December 31, 2004. After this assessment happened, PUR had become available with instructions in English, and expiration dates had been revised in recognition of the product's stability. However, these factors challenged the CTC staff's promotion of the new product that was essentially health-related.

The hardware provided (jerrycans, buckets, and filter cloths) for use with PUR was largely appropriate, and CTC staff observed that few families would have been able to afford to buy such hardware. In particular the choice of a jerrycan for water storage was probably the best means of minimizing re-contamination but it was not easy to fill a narrow-necked jerrycan with treated water from a bucket without a funnel. Program staff discussed providing funnels but did not for fear that the funnel might be used for other purposes such as for kerosene for lamps, and could introduce contamination if dirty.

The value of the one-liter bottle was questioned, but in fact many women reported that it was useful to be able to carry the water with them while away from the home and feed their child at any time. Purchasing ten-liter buckets was a mistake and the result of a misunderstanding concerning the quantity of water to be treated.<sup>62</sup> The quantity of water that can feasibly be treated in a bucket of this capacity is about nine liters. This means that the PUR is being used at a more concentrated dose than it is designed for. It is unlikely that there are any significant side effects from using PUR with only nine liters of water, though this needs to be confirmed. In general, seven sachets of PUR were provided to families, or 14 in the case of those families living a considerable distance from the OTP clinic. Only a few households reported that they needed more than one sachet per day due to the size of their family. Water consumption was not estimated but households reported that they had only one or two storage containers (this was supported by observation), suggesting a household consumption of between 20 and 40 liters. This situation makes the successful promotion of better personal and food hygiene very difficult.

60 The survey collected information on household characteristics water source type sanitation facilities diarrhea incidence and hygiene practices

61 Information was collected through observation and focus group discussions with mothers or other adult caregivers

62 Unfortunately it was not possible to exchange the buckets for larger ones

During household visits people commented about the taste and smell of PUR-treated water, though most of the women consulted said that they became accustomed to it. CTC staff observed that users of pond water more readily accepted the taste of treated water. This may be partly due to the very noticeable improvement in turbidity for pond water that is less noticeable for water from unprotected springs.

A focus group discussion was held with six mothers of enrolled children at Ganamii OTP clinic, in Bedeno Woreda. All confirmed that they used PUR and that the whole family drank the PUR-treated water. They found the taste was noticeable at first but they were now accustomed to it. All the women felt the hardware and treatment steps were not difficult to use. Asked if they disliked any aspect of using PUR, in general the reply was no, but one woman did comment on the time it takes to prepare, especially the stirring. Another asked if PUR could be made available to use in smaller quantities, such as one or two liters, because they didn't always have much water available for drinking. A suggestion was also made about getting a funnel with an inbuilt sieve.

The follow-up survey supported these findings about user acceptance of PUR. The overwhelming majority of surveyed households reported that the whole family drank PUR but a handful replied that one or more family members refused. The reason for refusing was usually disliking the taste or odor. With regard to making PUR easier to use, most comments reflected the difficulty of transferring water from the bucket to the jerrycan without spilling. In the observed households, the women all seemed to cope well with the water transfer. Other suggestions for making PUR easier to use included being taught how to use PUR at home, and reducing the time it takes to treat the water with PUR.

### Water Quality and Diarrhea Morbidity

It may be expected that diarrhea morbidity should be reduced through improvement in water quality, though other transmission routes may limit the potential improvement. Water quality following treatment with PUR has been shown to be generally very good in terms of turbidity and free chlorine residual criteria. Some pond water sources proved difficult to treat as free residual chlorine levels were low and turbidity was occasionally above the desirable 5 NTU level.<sup>63</sup> Tables A.9 and A.10 in Appendix 2 summarize water quality data from 17 different sources in Grawa and Bedeno.

The incidence of diarrhea was recorded in the baseline and follow-up surveys in an attempt to see a “before and after” type effect. Follow-up surveys however put considerable time pressure on the CTC staff and it was not possible to collect as much data as planned. Nevertheless, there did appear to be a substantial reduction in the incidence of diarrhea in Grawa, and a suggestion that the situation was improving in Bedeno. Tables 7 and 8 show the number of enrolled children that suffered diarrhea in the week prior to the survey visit.

**Table 7. Incidence of diarrhea at baseline and and follow-up survey; Grawa**

	Baseline	Week 1 follow-up	Week 2 follow-up	Week 3 follow-up	Week 4 follow-up
No. of children/household surveyed	49	48	40	29	12
No. children suffered diarrhea	20	5	1	1	0
Percentage children with diarrhea of total surveyed	41%	10%	3%	3%	0%

<sup>63</sup> There is no simple solution to improving the treatment of pond water with very high levels of turbidity. Pre-settlement or repeat treatment with PUR are possible options that could be considered

**Table 8. Incidence of diarrhea at baseline and follow-up survey; Bedeno**

	Baseline	Week 1 follow-up
No. of children/household surveyed	48	39
No. children suffered diarrhea	20	12
Percentage children with diarrhea of total surveyed	42%	31%

The results suggest that PUR had made a significant difference, especially in Grawa. However, it is hard to explain why the reduction in diarrhea in Bedeno was markedly lower at the Week 1 follow-up survey but no further data were available. The short monitoring period is one limitation of the data and we have no case-control data to help determine whether other factors may have contributed to the apparent reduction in diarrhea.<sup>64</sup>

Children in Grawa were discharged from the program faster than were children from Bedeno, which may indicate the PUR program's effect in reducing diarrhea. In Bedeno this was an average of 38 days as measured over the period March to October 2004 (PUR was not introduced in Bedeno until August 2004). In Grawa the figure was 29 days over the period September, 2004 to April, 2005. This difference however, could also be attributable to the CTC team being more experienced when it started the Grawa program than when it started the earlier program in Bedeno and Kurfachele.

### **CTC Team's Experience and Recommendations**

A mini-workshop was organized to review the CTC team's experience of promoting PUR. On the positive side, the promotion of PUR had raised awareness of water and sanitation issues such as keeping drinking water separate from water for other domestic purposes, hand-washing, and use of latrines. The visible changes in the water quality had been significant in convincing mothers and caregivers of the benefit of using PUR. The network of OTP clinics greatly facilitated both the training and distribution of PUR. Community Nutrition Volunteers (CNV) provided further encouragement and support in the communities themselves. Although some stakeholders including the MOH, Valid International, and CTC staff had doubted that mothers, who are often illiterate, could manage a chemical water treatment, the CTC team was convinced that using PUR does not present a problem for beneficiary families in similar programs.

The CTC staff's main worries concerned program design. For example, when the child has been discharged, typically after five to six weeks PUR might no longer be supplied to the family. Neither would it be possible to make PUR available to all families using unprotected sources within the project area because of limited stocks of PUR. The fact that PUR was distributed at the OTP clinics may have encouraged the belief that PUR was part of the medication used to treat severe malnutrition. Without this association households may not have been so willing to treat their drinking water.

### **CARE's Assessment of PUR in Haiti**

In September 2004, Hurricane Jeanne hit Haiti and left the city of Gonaives in a state of emergency due to severe flooding. Most relief organizations, including CARE, the International Federation Red Cross-Red Crescent, Oxfam, Action Contre La Faim (ACF), and the Service National d'Eau Potable (SNEP), first distributed bottled water to the affected population, and then chlorinated water to public stand pipes or water kiosks.

CARE from the SDWA visited the affected areas to assess the use of PUR in this emergency context. PUR was not generally used in the city of Gonaives following the flooding, although some NGOs, including PSI (which

<sup>64</sup> There was anecdotal evidence in the form of informal reports from participating families that since using PUR their children have suffered fewer episodes of diarrhea and vomiting

was marketing the product), did use PUR in a few rural communities near Gonaives. CARE assessed the impact of the security situation on logistics and beneficiaries' abilities to use PUR, the need for institutional experience in using PUR, and the appropriateness of PUR in comparison to other means of supplying safe water in these emergency contexts.<sup>65</sup> CARE used field visits and semi-structured interviews with representatives of CARE, USAID, PSI, Oxfam, and ACF. The Centers for Disease Control and Prevention (CDC), who had been assessing PUR's effectiveness in different countries, also assessed acceptability and effectiveness for emergency distribution, and the effect of educational messages for teaching families to use PUR in four villages near Gonaives in October, 2004.<sup>66</sup>

Senior CARE Haiti staff indicated that PUR had not been widely used by organizations that were providing safe drinking water. Some reasons for the limited usefulness of PUR in the emergency response to Hurricane Jeanne are examined below.

### **Availability of PUR**

The lead agency for distributing and promoting PUR in Haiti was PSI. In preparation for the launch of the PUR social marketing campaign in September, 2004, PSI demonstrated how to use PUR to organizations such as CARE.

On September 21 PSI provided CARE's Port-au-Prince office with around 100,000 sachets of PUR, enough to provide 3,500 families with 10 liters of safe drinking water per day for one month. The sachets were immediately transferred to CARE's warehouse in Gonaives, and although PUR was physically available to CARE and other organizations in Gonaives, it was largely unused and remained in CARE's warehouse. Eventually PSI requested the return of the stock for distribution through their networks.

### **Organizations' Knowledge of PUR**

Government departments and NGOs were largely unaware of PUR. PSI had begun PUR demonstrations for NGOs such as CARE, but only to head office staff in Port-au-Prince. PSI had not yet trained field-based staff nor begun using PUR in pilot projects.

PSI hoped to train staff of organizations including MOH, SNEP, CARE, Oxfam, UNICEF, and that this training would be replicated within the organizations and then with community leaders. Although some of the NGOs expressed interest, there were some reservations about PUR's effectiveness, and Ministry of Health staff thought that the steps for using PUR were too complicated for people to understand. CARE staff wanted to check the chlorine residuals for themselves and several samples were tested. The results were very mixed and even though these tests were less than exhaustive, they undoubtedly raised doubts about the efficacy of PUR.

PSI noted that often the organizations' staff that witnessed the PUR demonstrations were not those that would be expected to replicate the demonstrations to their own staff or community members. PSI also believed that the lack of familiarity produced concerns among some NGO staff with regard to the safety and possible side effects from using PUR. When NGO staff heard the precautions for use, such as avoiding contact with skin or eyes, they worried about promoting this unknown product. ACF staff commented that PUR's iron content could affect the treated water's taste or stain laundry. Oxfam staff commented that they were unsure whether using PUR in conjunction with treated water might lead to undesirable or hazardous by-products. They were also unhappy that PSI sometimes used Oxfam's water distribution points as suitable sites to demonstrate the use of PUR with Oxfam treated water. Furthermore, some NGO staff suspected that promotion of PUR was for financial gain, and that PSI was exploiting the situation for marketing purposes.

65 CARE's research into the use of PUR in Haiti was based mainly on its own staff's experience and to some extent that of other organizations during the emergency response  
66 Epi-Aid #2005-009 Trip Report. Assessment of post-hurricane Jeanne disease surveillance and emergency PUR distribution – Gonaives Haiti 2004 Anna Bowen Rom Colindres Seema Jain: EIS Officers National Center for Infectious Diseases CDC

### Packaging, Presentation, and Use of PUR

As noted above, the initial supplies of PUR available to the relief agencies had been produced for use in Latin America and sachet labeling and instructions were in Spanish, with an expiration date of October, 2004, which was uncomfortably near the time of program implementation. CARE staff were also concerned that because people were desperate for food in the acute emergency stage, PUR could be mistaken as a food or nutrition item. PSI was also worried that the distribution of a product that was about to pass its expiration date would be counter-productive to its impending national launch. Another issue with using PUR was the problem of corpses in the floodwater. CARE staff observed that people did not want to drink even treated water which had been in contact with victims' bodies.

CARE's program staff visited Lions Camp and discussed the drinking water situation with several families who had lost their homes in the flooding, and with two of CARE's health promoters and a member of the camp's administrative committee.<sup>67</sup> CARE had distributed buckets, cooking pots, and jerrycans but not filter cloths in the Lions Camp. They trained residents and the camp administration on the use PUR in the camp and other shelters in Gonaives. Four cases of PUR (960 sachets in total) were given to the committee at the time of the training and further supplies at a later date; during the visit four cases of unused PUR in the camp storeroom were seen. The experience of CARE's promoters had been that people were wary of PUR-treated water until they themselves drank the water. When asked about PUR, the camp residents said that they used PUR but not very much. They thought that the taste and smell were acceptable and said that they would use it again "if the water was dirty." They were also able to explain the basic steps of using PUR. One resident commented that "treating water with PUR was a nuisance and that bladder water (filled by the relief agencies operating tanker trucks) was much more convenient."

### Logistics

Since the relief organizations, government agencies, and affected population were all unfamiliar with PUR, mass awareness raising and training were essential. The agencies involved might not have been able to train enough of the population quickly, before other sources of safe drinking water were available. PSI had ready-made demonstration kits with the necessary hardware (buckets, stirrer, filter cloth, etc), but had trouble finding a suitable training venue that wasn't wet or muddy. Access was extremely difficult so there were limited opportunities to take the training to the various districts of Gonaives. In some areas water levels were so high it was necessary to have a guide walking in the water ahead of the cars because it was impossible to see where the road was.

About 80% of the affected population was in Gonaives, so most agencies concentrated their efforts there, and little or no tanker water supplies were provided outside of Gonaives. (ACF distributed about 14,000 sachets of PUR in Corridon, a village 20km from Gonaives.) Many relief agencies' staffs were already fully committed to relief operation activities and unavailable for running training sessions on PUR. PSI and USAID found that the affected population themselves were more concerned with food, clothing, and shelter, and that until the relief operation was mobilized there was little option but to drink water from any source. Although people congregated to collect food rations, it would have been impractical to carry out a PUR training session when people were trying to ensure they do not miss their turn to collect food.

Several relief organizations distributed buckets that could be used to treat water. However, many households had lost all their possessions, and some people used buckets provided for water collection to collect food and other items because they had no way to carry these rations.

<sup>67</sup> The Lions Camp was known as the "controversial camp" because most NGOs were opposed to the idea of establishing a camp outside of the city because it was feared that residents would be vulnerable to attack from gangs of thieves. It was also the only camp to house the residents in tents; the other shelters about 53 in total were all community buildings of some description.

## Security

Security concerns affected all aspects of the emergency response. Problems included agency vehicles being held-up or mobbed when they left the warehouse or offices, and people being robbed as they left a distribution point with their food rations. Oxfam noted that for a while everything from NGOs was being stolen. Oxfam's manager, who has seven years experience in emergency response including the Great Lakes and Angola operations, said he had not seen a more difficult security situation than Haiti. In addition to the robbery and attacks on local people, as well as vehicles carrying goods, the relief agencies were concerned for their own staff's safety.

## Alternative Sources of Safe Water

Another significant factor that explains the limited use of PUR was the rapid availability of alternative safe water sources. Several agencies, including CARE and Oxfam, reported receiving thousands of bottles of drinking water a few days after the hurricane, which were the first supplies of potable water available in Gonaives. So much bottled water was available, from 250ml water bags to 20 liter bottles of the type seen in offices and shops, that there were still stocks in the warehouses in early January 2005.

The Red Cross, CARE, Oxfam, ACF, and SNEP were all involved in the distribution of water to bladder tanks set up at strategic locations in the city including the shelters. The Red Cross pumped water from unused irrigation boreholes, and CARE had its own borehole within its compound. CARE began distributing water, around 150m<sup>3</sup> per day, by tanker truck on September 24. Tanker trucks worked up to 20 hours per day. In addition to the bladder tanks, water was also distributed via numerous water kiosks located around the city.<sup>68</sup>

Shallow groundwater is the principle water source in Gonaives, and private wells were very common. In some districts of the city, households even had artesian wells. Oxfam mounted an operation to clean and disinfect household wells that had been flooded. They also provided simple, low-cost replacement hand-pumps. In the higher areas of Gonaives private wells were untouched by floodwater and continued to supply water.

## PUR in the Post-Emergency Phase

By mid-January 2005 several relief agencies were scaling down their water-related activities as available funding decreased. For example, tanker-distributed water ceased on December 24, 2004, because funding agencies such as ECHO considered that the acute phase of the emergency had passed. Although many private and public wells had been rehabilitated and disinfected, the pipe network was still not operational. CARE staff believed that in some places people were likely drinking water from drainage channels. PUR could still be useful in some of the surrounding rural communities that either have no protected source or suffered damage to their water system.

PSI officially launched PUR on November 18, 2004, with a national social marketing campaign. The sachets were then printed in Haitian Creole and had an expiration date of June, 2007. At the time of this research, PUR had another water treatment product coming into the market, Dlonet, which was also being promoted by PSI. Dlonet is a low strength sodium hypochlorite solution that had been successfully used in programs promoting the "Safe Water System" concept that was developed by PAHO and CDC.

## COSTS AND FINANCIAL ANALYSES

This section describes a financial analysis of the commercial model and of the social marketing model that assesses the level of financial effort each project required. The analysis includes a break-even-point analysis,

<sup>68</sup> These had originally been built to operate as a community-level Durban Tank with a capacity of between 15 and 18m<sup>3</sup> and were once supplied with water from the city's pipe network



which is a useful indicator to help estimate how close or far a project is from reaching total cost recovery, and a cost-effectiveness analysis (CEA) for Pakistan and for Haiti. The purpose of these analyses was to provide an assessment of the projects' financial viability and help to set up objectives (and expectations) for similar interventions in the future.

## Commercial Model in Pakistan

Commercial interventions are usually measured in relative terms of cost-benefit and absolute terms of profit and losses, which informs about product performance and its presence in the market. The financial sustainability analysis for Pakistan was based exclusively on revenues and expenses for the promotion of the PUR brand. The analysis included only costs related to PUR promotion and not P&G indirect costs that could also be assigned to other P&G products in Pakistan.

### Sustainability Index

Table A.11 in Appendix 2 shows that total expenditures for marketing and distribution were \$2,557,000, which exceeded net revenues of \$83,951, resulting in a loss of \$2,473,049. These numbers give a sustainability index of 3.3%<sup>69</sup> which is well below the desired value of 70%. The product was removed from the market since it was far from achieving even modest financial results.

### Break-Even Point (BEP)

The "Break-Even Point" estimates the total number of units needed to cover costs and expenses for a product. New products typically take a number of months or years to reach BEP.<sup>70</sup> For P&G to cover the project's costs and expenditures, the project would have needed to sell almost 115 million units. This is equivalent to 1.1 million households being regular PUR users – not unreasonable given the total population of Sindh province of 5.02 million households.<sup>71</sup> However, sales were equivalent to only 41,177 households of regular users, or 3.7% of the BEP, far below a reasonable commercial objective.

### Cost Effectiveness

The cost effectiveness analysis estimated here includes the \$2,557,000 incurred by P&G for the marketing of PUR and CCP's expenditures of \$352,500 for mass media and community mobilization activities. Total expenses of both programs were \$2,909,500. Using results from the survey data we estimated that 2,044,000 households were exposed to the campaigns, and 308,000 households adopted water treatment behaviors – either PUR or other water treatment methods (see Appendix 2 for details about these estimates).

The estimated cost per household reached was therefore \$2,909,500 / 2,044,000 households, or \$1.40 USD. The estimated costs per new household adopter was \$2,909,500.00 / 308,000, or \$9.45 USD.

### Cost Shared / Opportunity Cost

This analysis provides an assessment of the Public-Private contributions in the commercial model. USAID directly invested almost \$600,000 and P&G invested \$2,589,000,<sup>72</sup> which gives a ratio of \$4.3 invested by P&G for every

<sup>69</sup> Sustainability Index (Net Revenue/Expenses) X 100

Sustainability Index (\$83,951/\$2,557,000) X 100

Sustainability Index 3.3%

<sup>70</sup> Based on market tests results this index should have been over 70% and certainly no less than 40-45%. P&G staff in Pakistan felt that if product sales had generated a better return sales would have continued. At such low sustainability levels revenues do not cover expenses.

<sup>71</sup> It should be noted that being at BEP means that the company does not have profit yet.

<sup>72</sup> Sindh Bureau of Statistics <http://sbos.sdnpc.org/sag3.htm>

<sup>72</sup> This figure excludes \$100,000 from the \$2,557,000 that correspond to salaries of the marketing team which are considered "sunk" costs and includes \$132,000 from product cost supplied by P&G.

USAID dollar. BCC advocacy activities for safe water treatment generated a response equivalent to \$307,055.<sup>73</sup> Adding this figure, the total amount invested in the project was \$ 3,496,055, of which only 17% was USAID investment. Every dollar that USAID invested attracted or generated \$5.80 USD.

## Social Marketing Model in Haiti

The same financial and economic analyses done for Pakistan are presented here for Haiti so that the two interventions can be compared on similar bases.

### Sustainability Index

In Haiti, the total expenditures for marketing and distribution were \$87,467, which exceeded net revenues of \$1,487, resulting in a loss of \$85,981 (see Table A.12 in Appendix 2). These numbers result in a sustainability index of 1.7%, indicating that the product required heavy subsidization to remain in the market.<sup>74</sup> The promotional activities and even distribution might not be expected to repay investment in the near or even mid-term future. The contribution of the project must be measured more from the public health perspective than from the financial perspective.

### Break-Even Point

To cover the project's costs and expenditures, the project would have needed to sell almost 38.2 million units. To reach the BEP, over 367,000 households would have to become regular PUR users, however, only an estimated 8,549 households were reached by the program, a figure far below the estimated need.

### Cost Effectiveness

Social conditions in Haiti prevented the fielding of the evaluation survey, therefore the cost effective analysis was based on estimates provided by PSI. PSI estimated that 8,549 households were reached through direct marketing, at a cost of \$51,892, or \$6.07 per household. It also estimated that approximately 20% of the country's population, or 266,667 households, was exposed to the mass media campaign, at a cost of \$ 4,033.88, or \$ 0.02 per household. Since the follow up evaluation was not fielded, the number of new adopters and cost per new adopter cannot be estimated.

### Cost Shared / Opportunity Cost

USAID directly invested almost \$500,000 in the Haiti social marketing program, P&G provided discounted product for a total value of \$35,000, and BLCF (DFID's Business Linkages Challenge Funds) invested \$179,979, for a total investment of \$814,979. For every dollar USAID invested in the project, partners (P&G and BLCF) invested \$0.36. This level of investment represents a 26.3% cost-share, which may be considered high among social marketing interventions.

Comparison of the commercial and social marketing models shows that for both interventions, the return on investment was low. The greater investment in the commercial models yielded a return that was similar to the more modest investment in the social marketing model (see Table 9 below). Since profitability is a basic condition for the commercial model, it was abandoned when returns were less than expected. For the social marketing model, it is only doable if very long term donor support is provided.

73 PR investment for water treatment totaled \$39 500 for a scientific seminar newspaper articles radio programs and infonews These investments generated the equivalent of \$307 055 worth of PR in airtime and articles published in 71 papers  
74 Sustainability Index (Net Revenue/Expenses) X 100

**Table 9. Cost and Financial Analyses for Pakistan and Haiti**

	Commercial Model (Pakistan)	Social Marketing Model (Haiti)
Sustainability	3.30%	1.70%
Loss	\$2,473,049	\$85,980
Break Even Point <sup>(a)</sup>	144,965,891	38,228,728
Cost per HH reached*	\$1.40	
Cost per HH reached directly		\$6.07
Cost per HH reached w/ MM		\$0.02
Cost Share Ratio	5.8:1.0	0.35:1.0

<sup>(a)</sup> Sales needed, in product units, to break even.

\* Costs include mass media and community level activities by both P&G and CCP.

Neither intervention model appeared to be better than the other. The commercial intervention had a marginally better sustainability index but with a much larger financial loss. Both interventions were far from reaching the break even point and in both cases, the cost of reaching consumer units (households) was much higher than the return provided. Results of cost analysis of direct marketing were somewhat unexpected for the social marketing program since this model specializes in direct interventions. For both interventions only mass media investment seemed to be recoverable.

This pilot experience shows that for behaviors that are not the norm, such as water treatment, interventions need to have a substantial investment and to commit to the long-term to allow time for the new behavior to develop, spread, and be maintained. Both programs assessed had almost a year of activities in the field. During this time, they were successful in increasing awareness about water treatment and about PUR, and gained new users of water treatment. However, more time was needed to consolidate these gains and turn them into a larger number of users. New products like PUR need intense community-adapted marketing activities framed within more comprehensive community programs to gain credibility, combined with effective mass media to gain reach and increase familiarity of the product with potential users.

## CONCLUSIONS AND RECOMMENDATIONS

This section summarizes conclusions and lessons learned from each of the partners' experiences in the SDWA program. While some of the points may sound repetitive, they were provided by each partner independently, so we have left them to reinforce important issues of this experience. The list provides partners' candid conclusions and important lessons that other water treatment programs will benefit from.

At the time that collaborators began to compile this report, SADA was implementing and adapting water treatment activities in other geographic areas in Haiti. The teachers trained had become resource persons to SADA. In Pakistan, HANDS was continuing with the community activities introduced through the project and PSI/Greenstar was preparing to market PUR.

### PSI'S EXPERIENCE IN HAITI

- PUR is a product that “you have to **see to believe it**” – achieving significant sales requires conducting thousands of public demonstrations of the product. These are effective, but time and labor intensive as they require more travel, and more time spent building relationships with potential consumers to generate high trial rates.
- PUR requires significant **investment in promotion** and advertising, particularly to make sure that potential consumers understand and can follow the process. It also requires a sustainability component (e.g. multiple donor funding, product cost recovery, micro-credit scheme).
- **NGO partners** in Haiti were crucial to attain program objectives, but appeared reluctant to adopt PUR as opposed to most other socially marketed products.
- The market niche for PUR is in areas where people have access only to **turbid water**. For this reason, PSI is promoting PUR further into rural areas in Haiti where turbid water is a daily reality.
- Many consumers feared **diarrhea**, and responded positively to messages that PUR can combat diarrhea. However, intensive educational efforts are necessary to reinforce the relationship between non-potable water and disease, encourage consumer behavior change, and achieve repurchase rates sufficient to result in sustainability.
- The current **price** of about US\$0.02 per liter of treated water was acceptable in Haiti.
- **Product usage** was perceived as “easy” or “very easy” by most consumers when they had tried it several times.
- Foreign volunteers, missionaries, and small community groups demonstrated considerable interest in micro-level PUR promotion. Successful promotion of PUR may rely on the effective coordination and participation of hundreds of these “**smaller**” partners.

### CCP'S EXPERIENCE IN THE PUBLIC PRIVATE PARTNERSHIP IN PAKISTAN

- **Combining social interests and corporate interests** proved to be difficult in some instances, particularly in the case of PUR positioning when working with NGOs. NGOs did not always accept that PUR needed to be promoted and studied in isolation. NGOs were more concerned about water treatment with any method available including boiling. Table A.13 in Appendix 2 provides other detail on the advantages and challenges from this PPP initiative.
- **Cost sharing** levels were very high. GDA brought in financial resources as well as active participation and commitment from the private sector.
- **Mass media** emerged as the least costly intervention, but given the short timeframe of the commercial model, the promotion of PUR was cut short, making the intervention less cost effective than it otherwise may have been if it had continued longer.

## CCP'S EXPERIENCE IN BCC IN PAKISTAN AND HAITI

- The **short time frame** of the project limited the engagement of local NGOs that were interested in the promotion of water treatment but had different time schedules. This resulted in one NGO per country being able to join the behavior change activities.
- Having **local NGOs lead the promotion** and discussion of water treatment in their communities conveyed trust. Participants openly and frankly discussed concerns and doubts about PUR with NGO facilitators.
- The **community dialogue** about water treatment practices in Pakistan and Haiti uncovered complex contexts at different levels (social, political, and environmental) but also identified existing practices and concerns that facilitators used to talk about the program's agenda. Acknowledging people's needs and concerns greatly facilitated gaining their interest and people became more receptive to the POU water-treatment message.
- Water treatment was found to be a **rare behavior** and something people don't talk about. Even for boiling, the method most known, people expressed doubts about the number of minutes they should boil. Promotion and supply of methods was found to be very limited, more so in Pakistan.
- Collective and individual **changes take time**. In both Haiti and Pakistan, many people felt powerless and had low self-efficacy about safe water. Given their poor living conditions, often communities felt that there was little they could do to affect the "real" changes that could improve their situation and overall well-being. Some of these obstacles were dealt with collectively through existing community groups and involving local leaders in a way that made people aware that they could work together and be able to make improvements and allow for individual and collective change about their drinking water.
- Building the trust for PUR included **offering a variety of options** and reinforcing that boiling was an effective method to purify water. This decreased the feelings of being forced to try PUR. In an attempt to position PUR as an effective method its promotion discredited boiling. Researchers found that this strategy did not help the uptake of PUR and created more doubts about it given that boiling **has been a highly trusted method** recommended by respected local leaders and authorities.
- In Haiti, where chlorine-based products have been promoted in the past, people showed less concern about PUR than in Pakistan. **Pre-existing fears** regarding an alleged conspiracy to decimate the Muslim population added to the concerns found in the focus communities in Pakistan because of the chemical content of PUR. Working on the community action plans and involving local recognized authorities in the communities helped overcome these fears.
- **Availability of equipment to use PUR** was a key issue in both countries. The population in the sites that were the focus of the community mobilization efforts was extremely poor. While the cost of a PUR sachet was not out of reach, the additional equipment needed limited its use as acquiring these utensils (e.g. 10+ liter buckets and scissors) competed with other household priorities.
- Dislike of **taste and smell** were the main reasons why users of PUR stopped using it. The visual effect however raised awareness among participants in both countries about the low quality of their drinking water.
- Survey results from Pakistan indicated that PUR was making a space for itself among people who had never treated their water and among those that used to boil. As any new technology however, PUR created doubts among potential consumers who needed more time to become familiar with the product and clarify concerns. The timeframe of the commercial model did not allow the product and its promotion to move at the pace of the consumer.
- **Gender-based household responsibilities** played a role in water treatment practices. Some women in Pakistan categorically rejected treating water at home because it was perceived as an additional burden on them while men remained unconcerned. In some households in Haiti, on the other hand, men facilitated the adoption of water-treatment practices, had initiated water-treatment practices at home, and were highly sensitized to the issue.

## CARE'S EXPERIENCE WITH PUR IN EMERGENCY SETTINGS

- **Hands-on learning** opportunities proved to be effective and should be considered in future PUR programs. Take-home step-by-step illustrations should be given to beneficiaries to reinforce proper use of PUR. Local people, even those with limited or no formal education, were able to understand how to use PUR. Demonstration sessions facilitated understanding and promoted hand-washing. Trainers emphasized the importance of minimizing hand-water contact, safe storage, and the use of a clean, and preferably dedicated mixing utensil and filter cloth.
- The **visual improvement in water quality**, especially when treating highly turbid water, convinced the target population of PUR's effectiveness. It also raised awareness of the importance of drinking-water quality and can be linked to the related health and hygiene issues.
- Although PUR was widely adopted in Ethiopia, many users commented on the **chlorine taste and odor**. While this is a common problem of chlorine-based disinfectants like PUR, it serves as a reminder that clear information about the benefits of water disinfection are needed and frequent reinforcement and follow-up to ensure continued use. People may have perceived that PUR was part of the medication used to treat severe malnutrition. Without this association households may not have been so willing to treat their drinking water.
- Data collected from Ethiopia suggested a **reduction in diarrhea morbidity**. Although this conclusion is derived from a small data set, other studies of using PUR in emergencies (e.g. Liberia) also supported the finding that PUR-treated water contributes to reduced incidence of diarrhea.
- **Appropriate hardware is a prerequisite** to successful implementation of PUR in an emergency and in situations of extreme poverty. Relief agencies should consider providing buckets and jerrycans as well as funnels to facilitate transfer of treated water into the jerrycan.
- It should not be assumed that PUR is appropriate to all emergency situations where safe drinking water is required, and **assessment of each individual situation** is essential. PUR may not be appropriate in the acute phase, but could be in the stabilized phase.
- **PUR packaging must be appropriate** to the local setting (e.g. language). Relief agencies must ensure that they don't simply transfer a stock from the neighboring country without considering the implications for implementation. Packaging could be improved with illustrations on the 'steps to using PUR' printed on the sachets, and an 'easy-tear' opening that does not require scissors.
- **Agency staff must be familiar with PUR**, understand how it works, how to promote its use, and have confidence in the product as regards its safety and health benefit.
- CARE's experience of using PUR in the Ethiopian and Haitian emergencies has been mixed. There are good reasons for this and it is neither a failure of the product nor the staff involved that is the basis for explaining the different outcomes. Table A.14 in Appendix 2 provides a comparison of the factors that influenced the adoption of PUR in Ethiopia and in Haiti.

## P&G'S LESSONS LEARNED FROM MARKETS WITH PUR

- P&G commercial markets with PUR Purifier of Water in Guatemala, Philippines, and Pakistan were not successful based on an expensive market entry strategy compared to the sales achieved. Repeat purchase rates were of 5-13% over periods from six months to a year.<sup>75</sup> For a new habit, these rates are a remarkable achievement in such short period of time, however, this was insufficient to achieve positive commercial returns on P&G's investment. Each market was closed down as a financial loss.<sup>76</sup>

<sup>75</sup> Note that the repurchase rates of 5-13% represent a core group of loyal product users that can be identified as the early adopters. The dominant message emerging from product users were that they were satisfied with PUR as an effective means of preventing diarrhea in their children.

<sup>76</sup> P&G has continued in these cases to promote the product using a social marketing mode.

- In the scaled-up commercial markets, complaints of tediousness of the process, taste, and affordability were the top barriers to repeat purchase. These barriers were effectively addressed in smaller scale, community-based efforts in Guatemala, Morocco, and Pakistan. In pilot launches, repurchase rates were of 40-60%, with purchase rates stabilizing and continuing for nearly a year before completion of the tests. In these smaller scale markets, the proportion of complaints of tediousness of the process, taste, and affordability were very low, demonstrating that community-focused communication can create long-term habit change and adoption of using PUR.
- P&G needs to develop a marketing plan that leads to a sustained spending pattern based on slower adoption rates for the treatment of drinking water. This strategy will require sustained credible and local communication networks. Product demonstrations generated sales and greater understanding of the product. However, it is not sufficient to see the product demonstrated once to form a life-long habit. P&G estimates that 5 to 6 exposures to the product from a credible source are required for the average family to adopt the habit.
- P&G realized that the level of spending in point of purchase interventions like painted storefronts was not cost-effective. For example, P&G typically painted a large number of stores on the same street so that the local trade did not get upset by only painting one store. However, this represented a significant effort that probably did little to impact sales as there was little differentiation between any of the outlets; one branded shop per street would have been more cost-effective.
- To support local groups in adopting PUR into their programs, time, effort and dedicated staff are needed. The spending plan and no/go decision pattern required by the commercial model did not allow for these relationships to be forged.
- NGO or institutional sales may account for almost half the potential market and P&G should aggressively pursue this as it will meet both the needs for sufficient volumes to reach sustainability for the distribution partner and allow for sustained community involvement by the NGO. The commercial model's timeframe did not permit this.
- High profile events did little for long-term habit change but they secured critical stakeholder support to prevent a negative reaction to the product introduction. The effort invested in Pakistan on a high-profile launch might have been much more cost effective if focused on local community-based efforts.
- Product demonstrations were effective in generating sustained sales in Haiti, Uganda, and Kenya, and an efficient system for conducting product demonstrations is required. This includes budgets for buckets, samples, cloths, spoons, etc. Other local groups should be involved in PUR education and training with their own programs, and high-level institutional staff should be involved developing relationships with appropriate groups.
- Table A.15 presents a list of things that have worked based on P&G micro-market experience and that need to be part of future promotion efforts.

## APPENDIX 1: PROGRAM MATERIALS

### PUR JINGLE

OU VLE YON DLO KI KLÈ, KI PWÒP?  
METE PUR!  
OU VLE BWÈ YON DLO KI SAN MIKWÒB?  
METE PUR!  
YON SACHE PUR TRETE 2 GALON EDMI DLO  
METE PUR!  
PUR SE YON VRE PWODUI MIRAK!  
METE PUR!  
VIDE L, BRASE L, KOULE L, TANN...  
AHHHH.....BWÈ L.....  
AK YON SACHE PUR, SANTE FANMI W KLÈ!  
METE PUR OOOOOOOOOOOO PLA PLA PLA  
METE PUR OOOOOOOOOOOO PLA PLA PLA  
(Voice at the end)  
PUR se yon pwodui PSI-HAITI

### PUR TV SPOT

2. Ak sante timoun mwen, mwen menm, mwen pa pran chans!  
(Mère dans sa cuisine, lui verse un verre d'eau et parle, debout derrière l'enfant qui boit - Elle lui caresse la tête)  
*The mother is standing up in the kitchen, and pours a glass of water behind the child who is drinking.*
3. Koulye a, Tou sa k pra l nan bouch pitit mwen, mwen prepare l ak dlo ki trete ak PUR!  
(Elle montre le petit sachet de PUR)  
*She shows the little sachet of PUR*
4. Lò ou pa sèten ki kalite dlo w ap bwè, Utilize PUR!  
PUR se sèl pwodui ki trete menm dlo ki gen labou... Epi ki wete tout mikwòb, viris, vè ak anpil move bagay ki ka ladan l.  
(De l'eau sale, de rigole, de mare - plusieurs "shots")  
*Shots of dirty water and gutters*
5. Yon grenn ti sachet PUR trete 2 galon edmi dlo.  
(Elle déchire le sachet et en verse le contenu dans un récipient plein de 2-1/2 glns d'eau)  
*She rips open the sachet and pours the contents into containers filled with 2 ½ gallons of water*
6. Brase l byen fò pandan 5 minit.  
(Elle remue vigoureusement l'eau avec une cuillère en bois)  
*She stirs vigorously with a wooden spoon*
7. Lò kras yo separe ak dlo a,  
(Gros plan de l'eau en fin de flocculation)  
*Close-up of water at the end of the flocculation*



8. Koule I nan yon twal koton byen pwòp...

*(Elle verse l'eau traitée à travers un filtre de coton, dans un récipient transparent)*

*She pours the treated water through a cotton filter, in a transparent container*

9. ...Epi jete ma a byen lwen, kote ni bèt, ni timoun pap jwenn li.

*(Une main en train de jeter le mat dans une latrine)*

*A hand pours the residuals in a latrine*

10. Kite dlo a poze pandan 20 minit, menm mezi tan pou ta kwit yon bannann.

*(Elle pose le récipient contenant l'eau traitée sur le comptoir de la cuisine, et le recouvre, pendant que l'on montre une pendule en background)*

*She places the contents of the treated water on the counter of the kitchen and covers it while a clock is shown in the background.*

11. Koulye a, dlo a PUR tout bon vre!

*(scintillement dans l'eau qui est versé dans un verre)*

*Water is poured into the glass*

12. E tout fanmi m kapab bwè li san pwoblèm!

*(Elle donne un verre d'eau au père qui entre dans la cuisine)*

*She gives the glass to the father as he walks in the kitchen door*

13. Mèsi manmi! Mèsi Doudou!

*(L'enfant saute au cou de la mère, le père l'embrasse sur la joue)*

*The child jumps to the mother's neck to embrace her while the father kisses her on the cheek*

14. Ak PUR, Sante fanmi m klè!

*(La mère, souriante, se tourne vers la camera)*

*The smiling mother turns to the camera*

15. W ap jwenn ti sache PUR sa a nan tout boutik, pou 3 goud sèlman

*(Gros plan du sachet)*

*Full screen of the sachet*

1. Manman! Mwen swaf!

*(L'enfant arrive en courant dans la cuisine, un ballon de football à la main)*

*The child runs into the kitchen with a soccer ball in his hand.*

## PUR JINGLE WITH VOICE-OVER

OU VLE YON DLO KI KLÈ, KI PWÒP?  
METE PUR!

*Texte voice-over:*        *PUR se yon pwodui mirak pou trete dlo.  
Li elimine tout mikwòb ki ka nan dlo a  
epi li fè l vin klè ak pwòp!  
Chak ti sache PUR trete 2 galon edmi dlo  
pou 3 goud sèlman!  
Ou annik vide l, bwase l, koule l,  
tann yon ti moman epi bwè l.  
Ak PUR, sante tout fanmi a KLÈ!*

AK YON SACHE PUR, SANTE FANMI W KLÈ!

METE PUR 000000000000 PLA PLA PLA

METE PUR 000000000000 PLA PLA PLA

*Signature: PUR se yon pwodui PSI-HAITI*

## APPENDIX 2: TABLES AND GRAPHS

TABLE A.1 MAIN WATER SOURCE USED FOR DRINKING, BY AREA OF RESIDENCE (PERCENTAGES).

Main source of drinking water	Rural	Urban	Total
Private water supply in home	11.7	58.3	28.9
Private well/tube well	51.4	24.5	41.3
Community tap outside home	13.1	5.8	10.4
Sample size	948	557	1,500

Source: CCP-PIDE Pakistan Water Survey'05.

TABLE A.2 WATER TREATMENT METHOD MOST REGULARLY USED, BY TYPE OF METHOD AND AREA OF RESIDENCE, AMONG THOSE WHO TREATED WATER IN THE LAST WEEK (PERCENTAGES).

Type of method more frequently used	Area of residence		Total
	Urban	Rural	
Boiling	11.0	36.0	25.0
Cloth filter	80.7	38.5	57.1
Alum	6.5	17.9	12.9
Filter	1.6	1.0	1.2
PuR	0.7	4.1	2.6
Other	1.3	3.6	2.6
Sample size	155	195	350

Source: CCP-PIDE Pakistan Water Survey'05.

TABLE A.3 WHAT CURRENT USERS OF PUR SAID ABOUT THE PRODUCT

Aspect of the product/use	Percentage
<b>Method used before PuR</b>	
None	40.7
Boiling	29.6
Dettol tablets	7.4
Cloth filter	7.4
<b>Reason for using PuR</b>	
Removes particles	40.0
Water looks clean	40.0
Water has good taste	16.0
<b>What they like most about PuR</b>	
Water gets clear	50.0
Particles settle down	42.3
Water looks shiny	7.7
<b>What they dislike about PuR</b>	
Taste	38.5
Smell	30.8
Difficult to make	11.5
Nothing	11.5
Expensive	3.9
Don't fully trust	3.9
<b>Will continue to use in the future?</b>	
Definitely/probably yes	52.0
Unsure	8.0
Definitely/probably not	40.0
Sample size	24

Source: CCP-PIDE Pakistan Water Survey'05.

**TABLE A.4 WHAT NON-CURRENT USERS THAT HAVE USED PUR SAID ABOUT THE PRODUCT**

Aspect of the product/use	Percentage
<b>Why not using at present time</b>	
Dislike taste	64.9
Dislike smell	21.6
Expensive	10.8
Takes time	2.7
<b>How long used</b>	
Less than a week	54.1
1-2 weeks	13.5
1-4 months	21.6
<b>Would use PuR in future</b>	
Definitely/probably yes	37.8
Unsure	16.2
Definitely/probably not	45.9
<b>What needs to change in PuR to use it</b>	
Improve taste	73.0
Less expensive	10.8
Easier to make	2.7
No smell	5.4
Don't know	5.4
Sample size	37

Source: CCP-PIDE Pakistan Water Survey'05.

**TABLE A.5 WHAT NON- USERS WHO HAVE NEVER USED PUR SAID ABOUT THE PRODUCT, BY AREA OF RESIDENCE**

Aspect of the product/use	Area (percentages)		
	Rural	Urban	Total
<b>Why haven't used it</b>			
No information about PuR	61.7	29.7	50.8
Has no time	9.6	22.1	13.8
Expensive	13.1	26.6	17.7
Not good for health	2.1	7.0	3.8
Has always boiled her water	0.5	7.4	2.9
Not available in stores	2.5	0.6	1.8
Other reason	26.7	28.0	27.1
<b>Would use PuR in future</b>			
Definitely/probably yes	16.7	21.2	18.3
Unsure	27.5	29.1	28.0
Probably not	20.4	18.4	19.7
Definitely not	33.7	28.9	32.0
<b>What needs to change in PuR to use it</b>			
Improve taste	1.3	10.5	4.4
Less expensive	2.4	9.3	4.7
Safe for health	0.6	1.2	0.8
No smell	0.11	1.9	0.7
Don't know	92.8	74.4	86.5
Sample size	938	485	1,423

Source: CCP-PIDE Pakistan Water Survey'05.

## GRAPH A.1

Graph A.1

Percent recall of each type of water message  
by urban-rural residence

Pakistan Survey, 2004

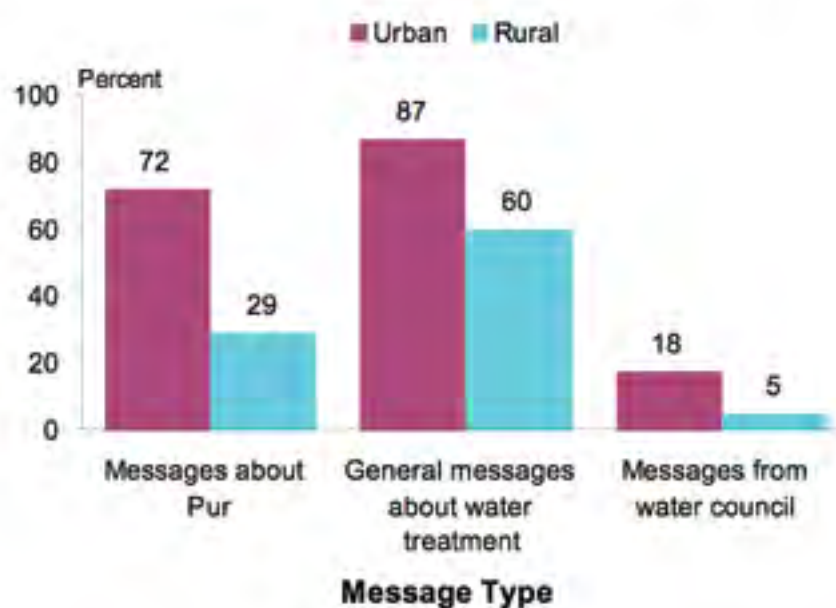


TABLE A.6 KNOWLEDGE OF PURIFICATION METHODS, SPONTANEOUS AND AIDED RESPONSES (PERCENTAGES)

Purification method	Spontaneous response	Aided response
Boiling	38.7	43.0
Chlorine	0.7	5.8
PuR	8.7	29.7
Dettol	1.7	16.0
Cloth filter	34.7	48.7
Other filter method	1.4	7.3
Alum	16.9	52.1
Solar system	0.5	4.2

Source: CCP-PIDE Pakistan Water Survey'05

**TABLE A.7 SOCIAL INFLUENCE VARIABLES AROUND WATER TREATMENT, BY AREA OF RESIDENCE**

Interpersonal communication about water treatment at home	Area (percentages)		
	Rural	Urban	Total
Talked to husband	19.2	39.5	26.6
Husband encourages water treatment	16.5	39.4	24.9
Talked to friends	13.0	31.3	19.7
Ever encouraged water treatment to others	10.1	29.0	17.1
Anyone has recommended water treatment	19.6	44.7	28.9
Health worker recommended water treatment	8.3	24.5	14.3
Sample size	948	552	1,500

Source: CCP-PIDE Pakistan Water Survey'05

**TABLE A.8 ALPHA SCORES FOR PSYCHOSOCIAL (IDEATIONAL) VARIABLES AND UNADJUSTED ODDS RATIOS WITH WATER TREATMENT**

Ideational variable	Number of items	Chronbach Alpha	Unadjusted Odds ratio
Knowledge of methods	8	0.68	10.7
Social influence	6	0.87	1.7
Perceived social norm	2	0.94	2.2
Attitudes towards water treatment	7	0.63	1.2

Source: CCP-PIDE Pakistan Water Survey'05

**TABLE A.9 WATER QUALITY DATA FROM VILLAGE DRINKING-WATER SOURCES IN GRAWA**

Village	Type of H2O source	Residual chlorine	Turbidity		Color
			Before treatment	After treatment	
Dogu tekuma re	Unprotected spr ng	0.35 mg/ t	B/n 5-10NTU	<5NTU	Crysta ne c ear
Chu u wajj n j regna	Unprotected spr ng	0.24 mg/ t	B/n 5-10 NTU	<5NTU	Crysta ne c ear
Chu u j ru be na	Pond	0.21mg/ t	B/n 300-400NTU	<5NTU	Crysta ne c ear
Chu u	R ver	0.22 mg/ t	B/n 40-50NTU	<5NTU	Crysta ne c ear
Doroba/tokuma Ja e a	Pond	0.5mg/ t	400 NTU	<5NTU	Crysta ne c ear
Chu u	R ver	0.80mg/ t	100NTU	<5NTU	Crysta ne c ear
Dogu/ Areb ja	Pond	0.48mg/ t	200NTU	<5NTU	Crysta ne c ear
Dogu/ M kawa	Unprotected spr ng	0.63 mg/ t	B/80-100NTU	<5NTU	Crysta ne c ear
E etatesa	Pond	0.14 mg/ t	400NTU	<5NTU	Crysta ne c ear
Chu u /J ru Be na	Pond	0.48mg/ t	80 NTU	<5NTU	Crysta ne c ear
Mojo	R ver	0.96mg/ t	150 NTU	<5NTU	Crysta ne c ear



**TABLE A.10 WATER QUALITY DATA FROM VILLAGE DRINKING-WATER SOURCES IN BEDENO**

Village	Water source	Turbidity		Residual chlorine	Color
		Before RX	After RX		
Geneimi Tiko	Pond	300NTU	<5NTU	0.14mg/lit	Crystalline clear
Hara Deneba	River	80NTU	<5NTU	0.46mg/lit	Crystalline clear
Ramis	River	200NTU	<5NTU	0.65mg/lit	Crystalline clear
Ije Biya	Unprotected spring	80NTU	<5NTU	0.87mg/lit	Crystalline clear
Jiru Belina	Pond	>500NTU	5-10NTU	0.26mg/lit	Crystalline clear
Tortora Guda	Pond	>500NTU	60NTU	0.01mg/lit	Crystalline clear

**TABLE A.11 PAKISTAN P&G EXPENSE & REVENUE**

<b>P&amp;G Pakistan</b>		
<b>Estimated Income/Loss PuR</b>		
<b>(May 2004 - Mar 2005)</b>		
<b>Revenue</b>		
3,774,540 Sachets @ \$ 0.05724 each	\$216,060	
Product Cost @ \$ 0.035 per sachet	\$132,109	
<b>Net Revenue</b>		<b>\$83,951</b>
<b>Expenses</b>		
<b>Marketing</b>		
Media	\$800,000	
Direct Marketing	\$1,500,000	
PR Activities for PUR product	\$100,000	
<b>Total Marketing Expenses</b>		<b>\$2,400,000</b>
<b>Distribution</b>		
Sales force salaries and expenses	\$100,000	
POP tools	\$30,000	
Launch Tools	\$17,000	
Launch Activities	\$10,000	
<b>Total Distribution Expenses</b>		<b>\$157,000</b>
<b>Total Expenses</b>		<b>\$2,557,000</b>
<b>Income/Loss</b>		<b>-\$2,473,049</b>

## Estimation of change in households treating water for Cost Effectiveness Analysis in Pakistan.

In the section "Understanding Behaviors for Safe Water," we showed that the effect of the program promotion resulted in an increase of 50% additional households treating their water. To estimate the number of new adopters of water treatment we proceeded as follows. The latest figures from the Sindh Bureau of Statistics estimated 5 million households in the Sindh province. From this total, around 70% fall in the C/D/E economic strata (PIDE data). This results in 3.5 million households represented in the household survey. An estimated 80% or 2.8 million households have children under 12, which were the selected households for the survey. Using the results of the propensity score analysis, 30% of households in the high exposure category and 19% in the none/low exposure categories were treating water. In terms of numbers of households these percentages result in 840,000 and 532,000 households, respectively. The difference between these numbers, 308,000 households are considered the new adopters that resulted from the water promotion messages.

**TABLE A.12 PSI HAITI EXPENSE & REVENUE**

<b>PSI Haiti</b>		
<b>Estimated Income/Loss PuR</b>		
<b>(May 2004 - Mar 2005)</b>		
<b>Revenue</b>		
649,732 sachets @ \$0.037288 each	\$24,227	
Product Cost @ \$ 0.035 per sachet	\$22,741	
<b>Net Revenue</b>		<b>\$1,487</b>
<b>Expenses</b>		
<b>Marketing</b>		
Media	\$4,034	
Direct Marketing	\$51,892	
PR Activities	\$14,501	
<b>Total Marketing Expenses</b>		<b>\$70,427</b>
<b>Distribution</b>		
Sales force salaries and expenses	\$6,472	
Launch Activities	\$10,569	
<b>Total Distribution Expenses</b>		<b>\$17,040</b>
<b>Total Expenses</b>		<b>\$87,467</b>
<b>Income/Loss</b>		<b>-\$85,981</b>

**TABLE A.13 ADVANTAGES AND CHALLENGES FROM THE PUBLIC-PRIVATE PARTNERSHIP IN PAKISTAN (CCP'S EXPERIENCE).**

Advantages	Challenges
<ul style="list-style-type: none"> <li>• Because of the aggressive commercial objectives P&amp;G set for itself, the level of investment was high when compared with social projects with the same duration and similar scope.</li> <li>• Cost share ratio achieved exceptional levels in Pakistan (3:1 ratio for the whole GDA intervention and more than 5:1 in Pakistan alone)</li> <li>• The partnership with P&amp;G gave the SDWA access to world-class service suppliers in the areas of media planning, advertising and PR in a very short time.</li> <li>• PR interventions in support of water treatment, with an investment of almost \$ 39,000, generated a response that was equivalent to more than \$ 300,000 in editorial and commercial value. Interventions included an International Scientific Symposium. These interventions gave the SDWA partners access and exposure to leaders of high political relevance and clout in country.</li> </ul>	<ul style="list-style-type: none"> <li>• Harmonization of commercial and public health agendas requires a great degree of social responsibility exerted by the partner from the corporate world. Having similar social goals facilitated program implementation and execution even when organizations have a different orientation towards profit.</li> <li>• Because of the profit orientation, time coordination was really challenging. Social orientation made organizations move at much different paces, which was a source of tension (resolved quite positively, though).</li> <li>• The orientation towards brand equity creation can sometimes be in conflict with the social objectives of the campaign. A great deal of understanding and flexibility is required.</li> <li>• Communication agencies sometimes became confused about whose directions they should take regarding tone and manner of the campaign.</li> </ul>

**TABLE A.14 FACTORS THAT INFLUENCED THE ADOPTION OF PuR IN ETHIOPIA AND IN HAITI (CARE'S EXPERIENCE).**

Key Differences	Ethiopia	Haiti
Acceptance	<ul style="list-style-type: none"> <li>It is possible that mothers and carers associated PuR with the treatment regime prescribed for their malnourished child.</li> <li>Although there were some agency concerns about whether beneficiary families could understand the steps to using PuR, there was little to lose by trying PuR and no simple, quick alternative for improving water quality.</li> </ul>	<ul style="list-style-type: none"> <li>PuR was largely rejected by relief agencies. They were experienced at providing emergency water supply by other means which were tried and tested and very effective. PuR was unknown, not trusted and, in the acute phase, impractical.</li> <li>In Gonaives few beneficiaries used PuR but commented that it was inconvenient (because of the time needed to treat the water) in contrast to water available from public stand pipes.</li> </ul>
Context	<ul style="list-style-type: none"> <li>The emergency setting can be described as stable. Access was not a problem, and there was not the prospect of impending violence or civil unrest.</li> <li>The emergency may be described as a slow-onset type with warning about a gradual deterioration in food security.</li> <li>Only the usual water sources were available for use.</li> </ul>	<ul style="list-style-type: none"> <li>The emergency in Haiti can be described as complex. There were major concerns regarding security and the potential for violence and further deterioration in civil society.</li> <li>A rapid-onset emergency with many relief agencies involved, especially those with experience in providing emergency water supply.</li> <li>Alternative sources used: bottled water, stand pipes, well cleaning and rehabilitation. No need for training and bulk distribution through stand pipes.</li> </ul>
Follow-up	<ul style="list-style-type: none"> <li>Weekly OTP clinics provided an excellent training and distribution facility. The CNV, MOH clinic staff and CARE field workers provided encouragement, support and reinforcement of the key messages.</li> <li>The gradual hand-over from CARE to MOH enabled a good understanding to develop within the MOH staff of how to manage the CTC program. It may also have reinforced the acceptance or confidence of the beneficiary families in seeing the MOH involvement</li> </ul>	<ul style="list-style-type: none"> <li>Finding opportunity and locations for training the target population proved extremely difficult. Follow-up support was next to impossible during the acute phase of the emergency.</li> <li>There was only a very limited network of people that were promoting PuR. The MOH had expressed considerable reservation in introducing PuR to a mostly illiterate population.</li> </ul>
Priority	<ul style="list-style-type: none"> <li>Although food security was a concern shared by most of the target population, the immediate priority for families was one or more severely malnourished children. Other basic needs were not being threatened.</li> </ul>	<ul style="list-style-type: none"> <li>It is speculated that the affected population had more pressing needs than water. There was great uncertainty about food, shelter and potential violence. Water, albeit dirty water, was not in short supply.</li> </ul>

**TABLE A.15 AUDIENCES AND ACTIVITIES THAT HAVE PROVEN EFFECTIVE IN MARKET-TESTING OF PUR (P&G EXPERIENCE)**

Audience	Intervention/activity	Recommendations
Mothers	Direct interaction with mothers is required to overcome the potential barrier of the tedious purification process. Those who became PUR users believed that their drinking water was unsafe and related to their children's diarrhea.	Need to figure out a way to leverage this so that outreach efforts are more efficient.
Fathers	They value the cost benefit of water purification in comparison with the cost of clinic visits, lost time in caring for sick children, etc. The programs reaching dads are also critical to overcome the potential barrier of affordability.	
Children's school programs	School programs worked to rally up community involvement; in Pakistan, P&G used Mr. PUR as a super hero and kids were eager to join the war against germs. Schools are also the place to overcome the potential barrier to taste.	While none of the school programs were sustained in Pakistan, one non-GDA experience in Morocco revealed a huge role for school programs, which made the program sustainable. Anecdotal observations from different countries support the involvement of schools.
Health clinics and nurses outreach	Although expensive to execute over long time periods, these are critical endorsement audiences. In Guatemala, children coming to the doctor with diarrhea received an identifying card for the doctor to discuss POU water treatment; physician endorsement was effective in building sales. In Morocco, the MOH endorsement was critical with consumers. In Pakistan, instead, the water ministry had an important presence in communities.	Strategic alliances with government are country dependant; in some instances, there exists little trust with government bodies.
Trade, retailers	The trade needs to see a demo and hopefully become users. Retailers who are users of PUR sell about 2-4 times more.	
Opinion leaders	Their endorsement is critical (religious leaders, landlords, health workers etc). In Haiti, community involvement through churches and school was thought to be a pillar of the campaign. In contrast, one of the micro-markets in Pakistan was hurt by not having established a relationship with the Oman, who was relating negative things about the product.	
<p>At the time of compilation of this report, P&amp;G had not yet determined the correct mix of spending on each of these elements and didn't yet know the best entry point to engage mothers. For P&amp;G, this SWDA experience had shown that product demonstrations are effective for uptake of the product, and more are required in future campaigns. P&amp;G would like to target mothers during these demonstrations. However, P&amp;G would not meet commercial needs.</p>		