Household-Level Point-of-Use Water Filtration in Haiti: Strategies for Program Management and Sustainability

by

Farzana S. Mohamed

S.B., Civil and Environmental Engineering
Massachusetts Institute of Technology (2000)

Submitted to the Department of Urban Studies and Planning and the Department of Civil and Environmental Engineering in partial fulfillment of the requirements for the degrees of

MASTER IN CITY PLANNING

AND

MASTER OF ENGINEERING IN CIVIL AND ENVIRONMENTAL ENGINEERING

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
September 2001

© 2001 Massachusetts Institute of Technology. All rights reserved

The author hereby grants to M.I.T. permission to reproduce and distribute publicly paper and electronic copies of this thesis document in whole and in part.

Signature of Author

Department of Urban Studies and Planning
Department of Civil and Environmental Engineering
August 21, 2001

Certified by

Paul F. Levy
Executive Dean for Administration, Harvard Medical School
Thesis Supervisor

Certified by

Peter Shanahan
Lecturer, Department of Civil and Environmental Engineering
Thesis Supervisor

Accepted by

Dennis Frenchman
Chair, MCP Committee
Department of Urban Studies and Planning

Accepted by

Oral Buyukozturk
Chairman, Department Committee on Graduate Studies
HOUSEHOLD-LEVEL POINT-OF-USE WATER FILTRATION IN HAITI:
STRATEGIES FOR PROGRAM MANAGEMENT AND SUSTAINABILITY

by

Farzana S. Mohamed

Submitted to the Department of Urban Studies and Planning and the Department of Civil and Environmental Engineering in partial fulfillment of the requirements for the degrees of Master in City Planning and Master of Engineering in Civil and Environmental Engineering.

ABSTRACT

The traditional approach of providing safe drinking water supplies through centralized large-scale systems has proven ineffective, costly, and elusive, particularly in serving the needs of rural populations in developing countries. The focus of safe water provision in developing countries is steadily shifting to the use of a body of smaller-scale point-of-use technologies, in which water is treated by its end user, that are cheaper, more appropriate for such contexts, and locally controlled. Gift of Water, Inc., (GWI), is a Florida-based non-profit organization that has been developing and implementing point-of-use household-level water purification projects in Haiti since its inception six years ago. In addition to providing seven Haitian communities with inexpensive point-of-use treatment systems for use in individual homes, GWI trains and actively supports a network of community technicians who are responsible for monitoring and troubleshooting filter programs, and for educating community members in the use of GWI’s systems. This thesis reviews the development of GWI’s programs in Haiti, recommends strategies for program management, and suggests mechanisms for ensuring program sustainability.

Thesis Supervisor: Paul F. Levy
Title: Executive Dean for Administration, Harvard Medical School

Thesis Supervisor: Peter Shanahan
Title: Lecturer, Department of Civil and Environmental Engineering
ACKNOWLEDGEMENTS

Many friends and loved ones have seen me through the writing of this thesis, and through six wonderful years at MIT. I owe the richness of my experience here to all of you.

Two people in particular deserve special thanks for this piece of work – Paul Levy and Pete Shanahan, for their insight, energy, approachability, incredible patience, and support. I am also grateful to the folks at Gift of Water, Inc. – Phil Warwick and Trudi Onek – for creating a great program, and for allowing me to potter around. I thank Bill Gallo, self-confessed culture junkie, for his guidance on Haitian culture. Matt Cyr provided invaluable information, and took us on some beautiful hikes. Eric Adams and Susan Murcott facilitated it all.

To the people who made it all happen:

Paul Levy, my advisor, role model, and friend, for teaching me some of my most valuable lessons, for your friendship and inspiration, for listening, and for teaching me to follow my heart.

Pete Shanahan, for smoothing the waters many times, and for your insight, concern, and invaluable guidance.

Jim Hines, for being a great teacher and friend, and for believing I could do it.

Federico Girosi, for being a super freshman advisor, and for trying to teach me to fly a helicopter.

David Marks, for telling me to stop worrying, and for always making time.

Mary Haller, for your inspiration and friendship, and for listening.

Arthur Steinberg, Debra Aczel, Alan Dyson, Leon Trilling, Richard Tabors, and the folks at ISP and TILT, for humoring my constant changes of mind, and for teaching me a well-used lesson: that it is easier to be forgiven for doing something than to get permission to do it.

Neal Addicott, Leslie Martin, and Heather Hillman, for being my best friends, for putting up with me, and for those laughter-filled evenings at the dinner table. ZBT and my little sisters, for being the source of many all-nighters and good friendships. Poonam, for 4am phone-calls.

Jackie and Muriel, for your warm hugs and humor. Cynthia and Sandy, for being simply wonderful, and for helping me iron out, to the last day, my many logistical quirks.

The Aga Khan Foundation, for supporting my work in so many ways.

My family, for giving me room to discover myself, for being my constant source of love and support, and for believing that a sense of curiosity will usually suffice. Sabrin Mohamed, for sharing part of it with me. The Boston Jamat, for being my second family.

Finally, to MIT, my home, and the place of extraordinary encounters.
# TABLE OF CONTENTS

1.0 INTRODUCTION .................................................................................................................. 6

2.0 HAITI AND GIFT OF WATER, INC. ...................................................................................... 8
   2.1 HAITI ...................................................................................................................................... 8
      2.1.1 Environment and Economy ......................................................................................... 8
      2.1.2 Society and Culture .................................................................................................. 8
      2.1.3 Water Resources ...................................................................................................... 9
   2.2 GIFT OF WATER, INC. ...................................................................................................... 10

3.0 BEST PRACTICE: GUIDELINES FOR PROGRAM IMPLEMENTATION .............. 13
   3.1 PROGRAM SETUP ............................................................................................................ 14
      3.1.1 GWI Staffing ............................................................................................................. 15
      3.1.2 Community selection ............................................................................................... 16
      3.1.3 Water committee and technician selection ............................................................... 17
      3.1.4 Filter distribution .................................................................................................... 19
   3.2 ONGOING PROGRAM SUPPORT .................................................................................. 19
      3.2.1 Community education ............................................................................................. 19
      3.2.2 Technician support .................................................................................................. 20
      3.2.3 Emergency funds and spare parts .......................................................................... 21
      3.2.4 Carbon changeout ................................................................................................... 22
      3.2.5 Record-keeping ....................................................................................................... 23

4.0 PROGRAM SUSTAINABILITY ............................................................................................. 24

5.0 CONCLUSION ....................................................................................................................... 29
LIST OF FIGURES

Figure 3.1: Map of Project Locations .................................................. 12
Figure 3.2: Water Education Posters in Ferrier .................................. 19
1.0 Introduction

The traditional approach of providing safe drinking water supplies through centralized large-scale systems has proven ineffective, costly, and elusive, particularly in serving the needs of rural populations in developing countries. The focus of safe water provision in developing countries is steadily shifting to the use of a body of smaller-scale point-of-use technologies, in which water is treated by its end user, that are cheaper, more appropriate for such contexts, and locally controlled. The landscape of actors involved in the provision of safe drinking water is evolving, too. In addition to governmental municipal authorities, non-governmental organizations, private voluntary organizations, community-based organizations and private for-profit service providers are increasingly responsible for initiating and maintaining water supply projects in a variety of settings (Gleick, 1999; Mintz et al., 1995). Gift of Water, Inc., (GWI), is a Florida-based non-profit organization that has been developing and implementing point-of-use household-level water purification projects in Haiti since its inception six years ago. In addition to providing seven Haitian communities with inexpensive point-of-use treatment systems for use in individual homes, GWI trains and actively supports a network of community technicians who are responsible for monitoring and troubleshooting filter programs, and for educating community members in the use of GWI’s systems.

GWI has achieved commendable results in educating and changing drinking water practice in households in rural Haiti. Additionally, the organization has helped create meaningful employment opportunities and sow seeds for capacity building through its technician and filter assembly programs. Nonetheless, GWI’s growth and learning as a non-profit development organization have not been without challenges. While GWI has achieved high rates of successful filter use in almost all of the communities it works with, a few of its project sites have been problematic. Filters are used inappropriately in some homes, taken apart and used for alternate purposes in others, and have, at times, gone missing. Technicians in some communities are highly respected members of the community, and well-received in homes. In others, the rapport between families and technicians is not as congenial; not surprisingly, projects in these communities do not fare as well as those in the first set. Certain communities have a dire water-supply problem, which impairs the ability of families to use the GWI filters consistently. Timelines for achieving desired success levels also vary from one project site to another. The first major component of this thesis aims to establish a set of “best practice” guidelines for project implementation that draws from the range of experiences at different sites with varying degrees of success.

The second key component of this thesis explores future directions for GWI, looking specifically at scenarios for program sustainability. As projects grow and mature across the country, GWI is undergoing its own rapid growth and change. For the first time in the organization’s history, its ability to produce filters is far outstripping its ability to train technicians and prepare communities to receive them; 10,000 new filters await distribution, well over three times the number of filters GWI has placed in homes over the past five years. Additionally, GWI is branching out into other countries. Program growth is not necessarily accompanied by an attendant growth in the resources, financial or human, needed to support it. Continued funding for maturing programs may become problematic; at this stage, no mechanisms exist to guard
against sponsor pullout, or lack of continued support. This change of scope and concerns, in addition to a desire to build local capacity, necessitate a revision of the organization’s project implementation structure, and an exploration of ways in which programs can become financially and managerially self-sufficient.

The next section of this thesis provides a brief history of GWI and a glimpse of the Haitian contexts within which GWI operates. The section that follows it highlights best practices and sets out guidelines for project implementation and management. The fourth section addresses next steps, exploring strategies for program sustainability. A brief conclusion and references for further study follow.
2.0 Haiti and Gift of Water, Inc.

2.1 Haiti

2.1.1 Environment and Economy

Haiti covers an area of about 27,750 square kilometers on the western third of the island of Hispaniola, bordering the Dominican Republic. Much of its rocky terrain is mountainous – about 60% of the island lies on a gradient of above 20% – and has largely been stripped of its natural forest cover, a result of agricultural practice and charcoal fuel production. About 60% of the country’s 7.8 million people live in rural areas, surviving primarily on subsistence farming. Income disparities are large, and the country’s average per capita GNP of $460 is one of the lowest in the Latin America/Caribbean region. The country’s capital, Port au Prince, is home to about a million people, many of whom live in large, dense squatter settlements within and on the fringes of the city.

Haiti is one of the poorest countries in the Western Hemisphere, and heavily dependent on foreign aid. Compared to other Latin American and Caribbean countries, it scores particularly low on a number of social indicators: well over 60% of its population lacks access to safe water; infant mortality strikes 71 out of 1000 live births, more than twice the regional average; and average life expectancy is 54 years, compared to a significantly higher regional average of 70 (World Bank, 2001). Many of the deaths of young children are linked directly to malnutrition and poor water and sanitation practices.

2.1.2 Society and Culture

Haiti gained independent status as the world’s first black republic in 1804, following a gruesome and bloody slave revolt that ousted its French colonists. Since then, its political history has followed a series of ups and downs, with political and economic control moving through the hands of various corrupt political leaders (mostly members of the capital’s elite mulatto -- part-French, part-black – population), dictators, and international intervention and occupation. My field visit to Haiti fell between the November 2000 re-election and February 2001 inauguration of Haiti’s current president, Jean-Bertrand Aristide, who was first elected as the country’s president in 1990. High levels of political tension surrounded this period, and travelers were warned of the dangers of political riots, which occur frequently around election periods in the nation’s capital. Aristide’s initial term of presidency witnessed a coup and strong criticism from...

---

1 Per capita GNP figures do not necessarily provide an accurate measure of development (see Meadows, 1996).
2 This section is informed by the following sources: Dogget and Gordon (1999); World Bank (2001)
the United States and Organization of American States that resulted in a series of trade embargoes and sanctions. The impacts of these sanctions, combined with the tense social climate, political instability, and the business community’s wariness of Aristide’s socialist leanings, have resulted in a state of poor confidence and investment in the country, further contributing to its poor economic state. Additionally, Haiti’s state of political flux has resulted in poor investments in infrastructure, and government-provided social services, particularly in non-urban areas, are all but non-existent.

Rural Haiti seems quite removed from much of the political tension that pulses through the nation’s capital and larger cities. Few government programs and services extend out into these areas, and much development-related work in these regions is carried out primarily through international aid organizations and, more commonly, church missions that provide medical and educational facilities. It appears that most aid missions, like GWI, have some sort of partnership with a church-based organization. The practice of Voodoo, once common in Haiti, is shrinking; the country’s population is predominantly Catholic, and about 10% of the population is Protestant.

Much of Haiti’s local culture reflects its association with France, and the cultural roots of its people. Local cuisine has strong French and African influences. The primary spoken languages are French and Haitian Creole, a language that grew out of a mingling of native African slave tongues and French, although fluency in the former tends to be limited to the higher echelons of society in the capital, and to the literate. Schooling is conducted in French and Creole, but in rural Haiti, and in the poorer areas of the cities, the latter is the primary language of communication.3

2.1.3 Water Resources

Haiti is believed to have an adequate supply of water resources to meet the needs of its people. The challenge to providing universal access to safe drinking water, then, lies in the management of this resource base (USAID, 1985; Panos Institute, 2000). Some communities have plentiful access to water, while others have a dismally unreliable supply. In Ferriere, one of GWI’s project sites, for instance, no household appeared to be more than a fifteen-minute walk from a groundwater pump. In contrast, household members in Barasa, another GWI project site, often have to walk a considerable distance along steep slopes to a small valley stream, where they may wait for several hours in the dry season to obtain water, and often return empty-handed. Water storage facilities in a number of rural areas are limited. Several households at various GWI sites that I visited over the course of three and a half weeks in January were hit by water shortages. Often, these households purchase water from neighbors who own private storage cisterns that either trap rainwater, or are filled by water vending trucks.

Haiti lacks a strong legal and institutional framework for the management of its water resources. Two government ministries, the Ministry of Agriculture and the Ministry of Public Works, share

3 This section is informed by the following sources: Courlander (1960); Wilentz (1989); Farmer (1994); Prince (1995); and Maguire (1996).
responsibility for the managing and developing the country's water resources. The Services des
Resources en Eau (SNRE), which falls under the umbrella of the Ministry of Agriculture, is
responsible for developing water resources for irrigation purposes, and is in charge of directing
water resource studies and control and protection programs. The Ministry of Public Works
extends drinking water supply services through two arms: the Centrale Autonome Metropolitaine
d'Eau Portable (CAMEP), which primarily serves the Port au Prince area; and the Service
National d'Eau Portable (SNEP), which covers about 10 cities outside the Port au Prince area.
Neither CAMEP nor SNEP is able to fully satisfy demand for water in the region that it serves,
because means to develop the resource are tight (USAID 1985). In practice, several additional
governmental and non-governmental organizations have a right to exploit water resources,
regardless of their technical ability to do so, and there is little control over the use of water
resources (USAID 1985). In a recent interview conducted by the Panos Institute (2000), SNEP
technicians indicated that drilling is conducted without apparent consideration of resource levels.
During my field visit to Haiti, a drilling project to divert much needed water to the growing
population and demand base in Port au Prince was in progress just outside GWI's project site in
Haiti; it is unlikely that the effects of this project on Dumay’s water supply were given much
consideration.

Aside from the problems associated with water supply, water quality issues present a significant
challenge in Haiti. Water from surface sources and uncapped springs is often highly
contaminated. Private vendors who supply water in the Port au Prince area often obtain it from
untreated sources, and do not disinfect it. While CAMEP and SNEP water is considered
relatively reliable, even its quality cannot be guaranteed, as treatment is irregular and hampered
by equipment breakdown (USAID, 1985). The lack of infrastructure and management capacity
makes central water treatment an infeasible, at worst, and costly, at best, option for the provision
of safe water to much of rural Haiti. Small community- or household-level programs, therefore,
present the most feasible and sensible option for the provision of safe water in these areas.
GWI's program provides households with an inexpensive channel through which they can
exercise some degree of control over the quality of their water supply.

2.2 Gift of Water, Inc.

Gift of Water, Inc. (GWI) was conceived and incorporated in May 1995 by its Executive
Director, Thomas (Phil) Warwick, who had volunteered previously on similar projects through a
range of organizations working in Haiti and the Dominican Republic. Then known as Industry
for the Poor, GWI’s organizational objective was to “empower impoverished families in rural
Haiti to purify their own water through the sustainable development of a maintenance network
and small scale enterprises” (GWI, 2000). Additionally, the organization maintains a core belief
that “education and monitoring programs are more important than the actual numbers of
purifiers” (GWI, 2000). To this end, GWI has been working in various Haitian communities to
develop sustainable water filtration programs that are run by a local network of GWI-trained
technicians who actively monitor and educate communities in the use of filters.

GWI initiated its activities in Haiti in late 1995 by teaming with a medical non-profit mission,
Adopt-A-Village, and a church-based organization, Bethel Foundation of Haiti, to conduct an
assessment of medical conditions and community needs in Dumay, a cluster of villages about an hour south of Port au Prince, the capital. This six-month field study recommended that a simple, home-based drinking water purifier program would be the most cost-effective means of creating large positive public health impacts. With the assistance of the Bethel Foundation of Haiti, headed by Pastor Nathan Dieudonne, a key figure in the organization’s current workings, GWI selected 50 Haitian families around Dumay to participate in a pilot phase filtration program, initiated in August 1996. A core team of six newly trained technicians supported the project in its initial phase. Within 7 months, 96% of participating households were using the filters appropriately. An additional 229 purifiers were distributed a year from the start of the pilot phase. That same month, 13 Haitians were trained to assemble GWI filters locally, from parts shipped to Haiti from GWI’s Florida parts factory, in a custom-built factory facility in Dumay.

The prototype filter distributed to the initial household cluster was a simple adaptation of a one-piece ceramic unit that Warwick had seen used in the Dominican Republic. Since then, the GWI filter has gone through several generations of redesign to evolve to its current state. The current chlorine-based purifier design is comprised of two detachable 15-liter plastic buckets – one for parasite and sediment removal, the other for chemical removal and taste improvement – connected by a check valve. Users fill the top bucket with water, add a healthy 10-milliliter dose of chlorine, then allow the water to stand for 30 minutes. At the end of the 30 minutes, the top bucket is lifted onto the check valve fitted to the bottom bucket, which opens up a flow of water into the lower bucket. Water flows through a cotton string sediment filter in the top bucket, and into the bottom one through a Granular Activated Carbon (GAC) filter. The GAC removes the chlorine, and most other organic chemicals that might be present in the water. A spigot on the bottom bucket allows users to draw clean water directly from the purifier; 5 drops of residual chlorine in the bottom bucket help ensure that pathogens are kept at bay during storage. The GWI purifier was independently verified by Brevard Teaching and Research Laboratories (BTR Labs, 1997) in November 1997, and, in July of the following year, became the first locally manufactured filter to be approved by the Haitian Ministry of Health (GWI, undated).

Since its modest beginnings in Dumay, GWI has expanded its filtration program to seven different communities across Haiti. Each decision to start a new program or to expand an existing one follows a particular pattern: first, an individual or group wishing to sponsor a filtration program in a particular community approaches GWI to explore mutual interests. GWI then works with the sponsor to help secure sufficient funding for the program’s first year – US$50 supports one family for a year – and helps appoint a local water committee to oversee the program. As its first task, the water committee, with some input from the project sponsor and GWI, selects a couple of individuals to be trained as technicians. These individuals travel to Dumay, where they undergo an intensive several-day-long training session that includes informational lectures on water and health, and shadow more experienced technicians as they go about their rounds. The training sessions are led primarily by three seasoned technicians, all of who have gained enough experience and training with GWI to have been promoted to “Master Technician” level. The water committee also selects households to participate in the filtration program, and sets an amount for the one-time fee that will be charged to households as a filter-leasing cost, part of which covers the cost of assembling the filter at and transporting it from the Dumay factory. GWI requires that a community achieve a 70% successful filter-use rate, as measured by routine technician-administered chlorine-presence tests and regular random
pathogen sampling by GWI's US contingent (often carried out with the assistance and oversight of US volunteers), before a program can be further expanded within that community. Program expansion, again, requires sponsor support.

In summary, GWI has ongoing projects in seven different communities scattered around Haiti. The oldest project community, which received its first filters four and a half years ago, is in Dumay, GWI's administrative and technician training base in Haiti. Dumay has well over a thousand filters distributed to families over a vast region. The second largest program, 600 filters strong, is in Les Palmes, a mountaintop community two hours driving-distance away. Similarly distanced from Dumay are the adjacent communities of Barasa and Fonds Verrettes, with roughly fifty filters each. The program in Fonds Verrettes is one of GWI's youngest, at barely four months. Two other communities, Ferriere and Bas Limbe, with programs less than a year old, are situated quite some distance apart in the northern part of the country. The collective number of filters in these two communities is also roughly one hundred. The seventh of GWI's project sites is Demier. The program in Demier, three months old, is the only one of the seven that was initiated and set up solely by GWI's Haitian master technicians without assistance from GWI's American members. All three master technicians live around the Dumay area, which also has eight local community technicians. With the exception of Les Palmes, which has eight community technicians, each of the other sites has two technicians, some fully certified through GWI's training program, and some still in training.

---

4 Program ages are calculated as of January 2001 throughout this document, unless otherwise indicated.
3.0 Best Practice: Guidelines for Program Implementation

The best practice component of this research grows primarily out of observation, comparison, and analysis of GWI’s field operations at different sites, contextualized by a broad literature review of effective frameworks for program operation in developing regions. In January 2001, I visited six of GWI’s seven project sites: Ferrier, Bas Limbe, Fonds Verrettes, Barasa, Les Palmes, and Dumay. At the time, the projects at these sites ranged in age from 3 months to four and a half years, covering a range of 50 – 1800+ households at each site. I did not visit the program’s youngest project site, Demier. It has therefore been left out of the best practice analysis. However, it is important to note that Demier is the only site at which the project has been set up entirely by Haitian technicians without the assistance of GWI. The project in Demier thus marks a critical step towards program sustainability, and is likely to present key lessons for future program implementation.

Best practice, as used in a development context and in this document, refers to a set of practices that produce desired objectives. Two objective assumptions underlie my recommendations. First, I assume that GWI would like to provide access to its programs to as many households as need it – in Haiti, well over 60% of the population lacks access to safe drinking water, about 4.7 million...
people (World Bank, 2001). Second, given that GWI has a relatively large pool of demand for its services, I assume that GWI would prefer to site filter projects in areas where chances of project success are stronger. Additionally, I assume that GWI’s overarching goal and intention for its projects is to build sufficient capacity for the programs to eventually be run locally.

Program success at each of the sites was judged by a composite variety of qualitative and quantitative indicators: GWI’s own sense of satisfaction with the progress of the program, consistency and accuracy of filter use, rapport between technicians and project households, and general level of water awareness in the community. The recommendations that follow in this section are drawn from past successes of and lessons learnt from the six project sites visited, and grounded on the assumptions outlined above.

Grover (1981) breaks down the process of program development and implementation into four stages: identification and preparation, appraisal and negotiation, implementation and supervision, and operation and evaluation. The first two stages can be loosely lumped to create a broad “program setup” category; he suggests that effectiveness and thoroughness of program setup is one of the strongest indicators of program success. It is additionally often the most overlooked.

This correlation between thoroughness and attention paid to program setup and program success appears to hold true for GWI’s projects in Haiti; through my review of project sites, three key factors appear to link most strongly with program success:

1. Effectiveness/thoughtfulness of program set-up process (who was involved in program setup, length of time invested in program setup, and degree of local information and input considered in program setup)
2. Selection of effective technicians who have a respected stance within a community
3. Presence of other community development programs/activities

GWI’s program setup stage may be broken down into five elements: community selection, water committee and technician selection, technician training, community education, and filter distribution. After the program setup stage comes the ongoing support, operations and maintenance stage. The success of this second stage derives largely from the success of the first. For GWI, this stage includes continued technician support and training, monitoring, community education, and general troubleshooting activities. A third stage of the program, as yet undeveloped and untried for GWI, would consist of some form of exit strategy and paced turnover of project control to local hands; suggested scenarios for the first steps of this process are presented in the subsequent section. The following recommendations are drawn from the successes and lessons of the six project sites, and, I believe, will improve GWI’s project delivery and chances of success.

3.1 Program setup

Overall, because of the importance of this stage to program success, GWI needs to play a more consistent and much more hands-on role in facilitating, advising, and providing stricter guidelines for the entirety of the program setup stage, from site, water-committee, and technician
selection to household filter distribution. Two primary factors pose a significant barrier to GWI's ability to play this role optimally:

- First, not a single person on the US contingent of GWI's staff speaks fluent Creole, seriously hampering GWI's ability to communicate with project staff and households. While two of GWI's master technicians speak English, their level of fluency and comfort with the language is still not developed enough to translate fine nuances of communication.
- Second, administering GWI programs is not a full-time position for either Thomas (Phil) Warwick or William (Bill) Gallo, the key people involved in and authorized to make decisions about program setup from GWI's US end; neither Warwick nor Gallo draws a salary from GWI.

3.1.1 GWI Staffing

Because of the rapid expansion of GWI's programs in Haiti, and of the increasing need for communication among projects across Haiti, as well as between Haiti and the US, I recommend that GWI hire an in-country manager for each country in which it has projects. Ideally, this person would have a Bachelors degree or equivalent, good understanding of the relationship between water and health, strong community organizing skills, diligent record keeping capacities, strong team management, leadership, and troubleshooting skills. The ideal candidate would have experience working in or be able to function effectively in a multi-cultural environment. The manager must have a high degree of fluency in common working languages of the country – English and Creole, and preferably some French in Haiti, as teaching materials are in French – and, for optimal impact, an intimate understanding of local customs, culture, and social structure. The responsibilities of this manager should include new-program setup and program expansion, overseeing program monitoring, liaising regularly with GWI's Florida and Dumay headquarters, and, as time allows, meeting volunteer groups. Additionally, the manager should have the authority and approval to make key decisions regarding staffing and user fees, in consultation with the local water committee. Because of the responsibilities the manager is expected to assume, suggested salary should at a minimum be equal to that of Emmanuel, the head master technician. Additionally, the manager should have sufficient resources at his/her disposal to travel around program sites, make random, unannounced checks, and retain the ability to initiate communication with GWI headquarters.

In addition to hiring in-country managers for each program country, it may be prudent for GWI's key non-salaried staff, Phil Warwick in particular, to consider drawing a salary. The presence of an in-country manager may alleviate some of the need for Warwick to travel to Haiti, but it is likely that organizational needs will become more complex as the programs grow and spread to other countries. It is important for the organization’s and programs’ health that key figures within its administrative levels be fully available to deal with concerns as they crop up and evolve. Average salary levels for the Executive Directors of non-profits fall in the general range of $45,000 to $70,000 plus benefits. (Idealist.org, 2000)

Adequate staffing and solid cultural and language interpretation capacity will go a long way towards helping establish successful programs based on the guidelines recommended below.
3.1.2 Community selection

Currently, GWI’s site selection process is largely sponsor-led, rather than based on particular criteria built around community-driven needs or an exploration of the resources and opportunities available at particular sites. This sponsor-led process, whilst it ensures that programs are supported to some degree for at least some period of time, has resulted in two immediately apparent impacts – first, GWI’s sites are spread out across the country, posing significant difficulty and expense in communicating and moving among the different sites; second, the level of local resource availability and support for the water projects varies significantly from site to site. These impacts make it challenging at best to provide consistent support across programs, and hamper the degree of learning that can be gained through site-to-site interaction. The sponsor-led process, if unaccompanied by an intensive field site exploration, might also result in the siting of a project in conditions where it may be inappropriate, or where resources simply do not exist to support the project. In Barasa, for instance, water scarcity is high, and people often lack access to sufficient water to use the filter consistently. In Bas Limbe, support for and interest in the project is low at the local leadership level, making it difficult to gain momentum in the local community. Up until this stage, however, GWI has had to rely on sponsor financing to build up support and recognition for its programs. Given current trends in demand growth, however, and the possibility of novel financing schemes (explained in greater detail in section 4), GWI can now afford to and should be more selective in its choice of project sites.

Based on my review of project sites, I believe GWI should ask the following set of questions as part of an expanded and more intensive field exploration period, at the end of which it should decide whether or not to start or expand an existing project in a particular area:

- Are enough resources available in the community, in terms of financial and time commitments on the part of households and local leaders, and sufficient water availability?
- Are there contact people in the community who are willing to commit to the program as a priority?
- Are there other organized development activities taking place? How can these existing networks of people and resources be drawn upon for implementing the water program?

While I do not have specific facts to support the link between water project success and presence of other development activities, it is my impression that this linkage exists, and was visible during my visits to project sites. Fonds Verrettes and Ferrier in particular have leveraged this linkage well, and the water committees in both cases have invested in exploring local initiatives outside the strict boundaries of the program; exploring communal cistern-building, and a continuous community-wide education program respectively. Ferrier has provided its technicians with uniforms, to add to their recognition in the community, and Fonds Verrettes is exploring the same.

There are no clearly right answers or cut-off points for these questions; they are simply intended to flag issues that deserve consideration, and which seem linked in some way to project success.
I did not spend enough time at each site in Haiti to be able to produce clear rankings of the sites with regards to the availability of various resources. However, these questions provide a starting point from which to develop rough benchmarks for judging whether to start or expand a project in a given community. The benchmarks would best be tailored further by a person who is more intimately familiar with Haiti than I.

3.1.3 Water committee and technician selection

The water committee and technician selection process is one of the most crucial factors in the fate of a project. To command the respect of the community that may yet need to be taught about the importance of safe water practice, water committee members and technicians need to be trusted and known widely within their communities. Additionally, they need to agree to make the project a priority in their activities, and to commit the necessary time and attention required by their responsibilities. The technicians in Ferrier, Fonds Verrettes, and Dumay appear to be highly respected and recognized individuals within the community. In contrast, the Bas Limbe technicians seemed to be neither recognized, even by households they are supposed to service, nor respected. In Barasa, while one of the technicians, Monsieur Dondon, is a highly respected local, he is unable to commit the time necessary to effectively administer the responsibilities of that program. The difference between project successes at the sites speaks for itself. GWI is not unaware of the importance of technician selection, but, because it frequently operates in initially unfamiliar communities, added to language and cultural barriers, I suggest the adoption and replication of a successful framework, used by Matt Cyr in Fonds Verrettes, for improving selection.

Prior to selecting members for the water committee, Cyr researched, through contacts at the local church and schools, existing local organizations whose networks could be drawn on for leveraging local support for the program. He drew up a list of people from two organizations, Kommunite Development (KD) and Foundation Economique Assistance Societe (FAES), actively involved in community development activities in Fonds Verrettes. In addition, because he was familiar with locals, and in the area, he asked people that he knew to recommend community members who they felt were reliable, approachable, respected by people in the neighborhood, had a good sense of ethics, and were usually around and reachable. From the initial list, Cyr invited three members from each of the five districts in Fonds Verrettes, making sure that at least one female was represented on each group of three. He also invited representatives from the local medical institutions, and any other organizations or individuals that would form natural stakeholders in the filtration project. The 15-member group then elected voting water committee officers: a president, vice president, treasurer, secretary, two advisors, and a delege (Creole word for a runner. The delege is responsible for ensuring that all committee members are kept informed of meeting times, and generally functions as the communication

---

6 Matt Cyr is a young American teaching in Fonds Verrettes. He learnt of GWI’s program in neighboring Barasa, where he spent a year, and raised funds to sponsor a new project in Fonds Verrettes. Matt’s fluency in Creole, local knowledge, and community organization skills have enabled him to assemble a very competent team in Fonds Verrettes.
“hub” of the committee.). It was simply luck of the draw that all five districts were represented within this seven-member committee, which has one female member.

The non-voting members of the committee were then invited to apply for the two available technician positions, once the responsibilities of that position had been explained to the committee. Three people applied for the two slots – one female and two males. At the beginning of the information process, Cyr had explained the importance to potential project donors of female representation on the committee and in the technician pool. The female, Helene, therefore automatically received one of the technician slots. However, she too had to prepare a statement of interest in the position, as did the two other technician applicants. Each applicant delivered a statement to the water committee on why he or she was interested in the position, and what he or she would bring to it. The voting members of the committee then voted to select between the two male applicants, and settled on Dieumaitre, the second Fonds Verrettes technician. This selection process ensured that the technicians are not only respected by local folks and hold the mutual respect of the water committee, but are also actively interested in being technicians. Additionally, it allows for a more thoughtful and staged selection process that then mirrors itself within the water committee’s future deliberations.

Cyr’s explanation of the requirement for some sort of gender balance in both the water committee and technician mix before the actual selection process, and his presence through it, probably helped avoid the problem recently experienced in Les Palmes, where four of the eight male technicians were fired so that female technicians could be appointed (Warwick, personal communication). This fact adds further import to the need for GWI to set stricter guidelines upon which to base these processes, and to be present in a facilitative or advisory role through program setup.

Water committees should have significant decision making power that should be weighted more strongly than program sponsor desires. GWI needs to dance a fine line between ensuring this is the case and facilitating and advising decision-making. One way to ease this challenge is to present firmer guidelines for operation ahead of the process, and staying intimately involved through the set up process, rather than simply at the end of it, at the decision-making stage. The cost of overriding local decisions is high, as indicated by the Bas Limbe project. During a rather agitated community meeting in Bas Limbe in January, Father Dubois, the head of the local water committee, communicated his frustration with the program to the master technicians who were acting as translators for the meeting. He had wanted to charge a $10 leasing fee for the filters, but his decision was over-ridden by the project sponsor, who wanted to charge $6. Adequate quantities of chlorine, as a result, were not available in the community. More importantly, Father Dubois felt that his decisions and input were not of value to the committee, and has therefore not taken on a much-needed leadership role within the program. It is also my impression that this fact was not communicated fully in the translation to Gallo who was running the meeting, a problem that could be avoided in the future by bringing on a staff member who is fluent in Creole.

Based on the approximate time frame – three to four weeks – it took Cyr to carry out this exploration and set-up process, and on suggested time frames for pre-project feasibility studies (Grover, 1981; Goethert, R., 2000), this process is estimated to take on the order of six to eight
weeks to perform effectively. This time includes time spent gathering information from and about the local community, time spent getting voting systems in place, and basic community education or initial social marketing time.

3.1.4 Filter distribution

GWI presently provides few guidelines for distribution of filters among households, aside from requiring that disbursement be equitable, without regard to religious preference, socio-economic status, or similar criteria. This lack of more specific guidance has resulted in poor placement of filters from a project manageability standpoint. In Les Palmes, 400 filters were distributed on a first-come first-served basis; the distances between houses are vast, exacerbated by the fact that Les Palmes is a mountain-top community, and houses are spread out over several steep peaks to begin with. The Fonds Verrettes water committee, on the other hand, made a deliberate decision to contain filter distribution within a manageable pre-set boundary before they assigned filters to households. Additionally, the Fonds Verrettes committee made a conscious decision to site filters in homes where it knew, from local experience, that household members would make a commitment to using the filters and set an example for other households. Faced with a decision between two households, all else being equal, the household with the greater degree of literacy, or “smartness,” was chosen to receive a filter. I recommend that similar criteria be presented and used to distribute filters in all sites, and particularly in new ones, where placing filters in conditions amenable to success might lead to better adoption and growth of the project. Local knowledge, in the form of input from water committee members, is invaluable at this critical stage.

3.2 Ongoing program support

3.2.1 Community education

In Dumay, I had the opportunity to observe a monthly community meeting. These meetings are an effort to provide continued community learning and reminders of water-health relationships, and are conducted as follow-ups to meetings that interested households are required to attend prior to being given a filter. The meeting that I attended was conducted in a manner that is probably not dissimilar to the ways classes are conducted in schools, where a teacher stands in front of the classroom and gives a lecture. The meeting started with a prayer, as do most gatherings in Haiti, and continued on in lecture format, with first Joliette, one of the female technicians in Dumay, then Emmanuel, the head master technician, presenting. Each of them repeatedly stressed the importance of filter use, the relationship between drinking bad water and getting sick, and made repeated reference to the fact that a lot of Americans were spending a lot of money to come to Haiti to help on this important project. About 70 people were in attendance at the meeting, roughly 50% of whom were women, with older children making up the bulk of the remaining attendants. A number of people appeared distracted and bored, and there was no opportunity for questions and answers. However, I recognize that it might be culturally
inappropriate and uncomfortable to have a question and answer session at a Haitian gathering; people do also get a chance to ask questions of their technicians during household visits. It is unclear whether or not regular large group meetings of the same kind might produce effective changes; smaller group meetings, with some opportunity for interaction through group exercises and appropriate demonstrations, that are targeted at particular groups – children’s, women’s, school groups – might provide effective avenues for learning interchange.

I saw few other forms of community education, with the exception of the project in Ferrier, which had developed a couple of colorful and simple posters, displayed below. In Dumay, Fonds Verrettes, and Ferrier, children are taught about good water practice in schools, an initiative spurred in most places by the same actors responsible for initiating GWI programs in those communities. GWI would benefit from more active initiation or support of programs such as those that encourage keener awareness of good water-related behavior. Increased awareness of and demand for filtration will help ensure program sustainability and sustained behavior change. Postering, word of mouth, and other forms of continued education and social marketing practices are therefore essential.

![Water Education Posters in Ferrier](image)

**Figure 3.2: Water Education Posters in Ferrier**

### 3.2.2 Technician support

**Technician funding**

When I visited project sites and spoke with technicians in Fonds Verrettes and Dumay specifically, they indicated strong dissatisfaction with salary disbursement. In January, the Fonds Verrettes technicians had not received payment for over three months worth of work, a fact that the water committee members were irked by and disappointed with. Salaries are paid out every
three months, for work done in the previous three months, by checks that need to be personally picked up from GWT’s headquarters in Dumay by all but the Ferrier and Bas Limbe technicians, whose checks are routed through Sr. Pat Downs, the head of the water committee in Ferrier. In a country where disposable income is low, and salaries are generally paid monthly, this practice creates significant problems for the technicians. Additionally, it sets a poor precedent for future program sustainability and self-financing, where project success will depend to a large degree on the timely payment of technicians and other project costs. It appears that some of the glitches surrounding payment disbursement are a result of local banking practice, which for some unknown reason necessitates the three-month payment frequency. If that is the case, then payments should be forwarded to Dumay three months in advance, rather than retroactively, from where they can be dispersed monthly. Technician salary disbursement could be further simplified by clustered project sites, so technicians would not be required to travel great distances to pick up their checks, another plus for heightened site selectivity.

**Route management**

Technician routes need to be more dynamically managed to ensure that they are manageable. This step is particularly important to revisit when new households are added to the project. In Dumay, households are presently configured into close clusters. Technician routes, however, are spread out over more than one cluster, a legacy from original route assignments that have not been revamped as new households are added. Routes need to center around household clusters for them to be more manageable, and be reviewed as projects grow.

### 3.2.3 Emergency funds and spare parts

A number of households in the various project sites have had problems with cracked buckets, where the top bucket of the two bucket system develops a crack along its bottom surface around the check valve. Some households, particularly those further away from Dumay, had to wait extended periods of time without bucket replacements, because purchasing new buckets is expensive, and would have required the drilling of a hole to fit the check valve. While technicians have access to some parts, it is unclear that each of the project sites has a well-stocked inventory of spare system parts sufficient to deal with multiple simultaneous system breakage. Each project site should have easy access to such an inventory. The actual size and mix of inventory should be based on past records for that particular community, and can probably be developed with the input of local community and master technicians.

In addition to a spare parts inventory, each project site should have some funds available to cover unforeseen expenses – for instance, the costs of new buckets if they are needed fast, or part of a technician’s salary if payment is delayed for any reason might be good enough reasons to draw on this emergency fund. The exact size of the fund should vary proportionally to the costs of the project, largely a factor of the number of technicians serving a particular site, and should at any time be equivalent to at least 10% of technician cost. The fund should be maintained by the water committee, controlled by a committee-elected treasurer, and should require around a 2/3-committee vote to authorize its use. Some project sites do have a small reserve fund, created by
charging a small additional fee over the $6 that the water committee is required to collect from each household and send to Dumay to cover filter assembly and transportation costs. In practice, water committees often do charge a small premium on the one-time filter lease cost, with costs ranging from $6 to $10. The specific source of this emergency fund can vary from community to community; it is best for project sustainability and self-sufficiency reasons if the funds are sourced from users, but because the creation of the fund is a one-time rather than ongoing expense, its source is not critical. Funds used should be replenished through charges administered to recover the cost of what they are used for, however.

3.2.4 Carbon changeout

The carbon in the carbon filters is not being replaced on a regular basis, despite the fact that technicians are aware that it needs to be changed every 6 months on average for a regular Haitian household. The GWI filter is intended to be self-correcting: when the carbon filter is past its useful life, chlorine from the top bucket flows through into the bottom bucket, thereby increasing the concentration of chlorine in the lower bucket. The community technicians who regularly conduct chlorine presence tests should notice this increased concentration. In practice, however, based on my observations of the testing procedure, when chlorine concentrations are higher than expected, the common tendency is to assume that the household simply puts too much chlorine into the water. To eliminate this source of uncertainty, I recommend that a simple system be devised and implemented that involves households in the process of tracking filter use and carbon change-out. One device might be a retrofitted mechanical spring device, similar in design and function to the newly developed Brita® Filter Replacement Indicators that now ship with new households filters of the same brand in the US, but adapted to work with the GWI filters. The filter indicators snap on to the top of the carbon filter in the Brita filter. As water passes through the indicator over the life of the filter, an easy-to-read dial on the indicator moves from "new" to "reset" making it simpler to keep track of when to change filters. Alternatively, a color-coded indicator strip, similar to the blue toothbrush bristle colorants might be developed. A simpler, albeit more prone to human error, system would be to provide sticker labels with the appropriate number of grids of allowable runs before filter change, say a hundred, that should be placed on the bucket. A separate set of small individual stickers can be provided, and household members can be taught to place a sticker in a grid each time the filter is run. Alternatively, a simple pen-and-paper system can be used, again with a gridded label and pen fastened to the bucket. To ensure the integrity of such a monitoring system, one of the things a technician should note down during each household visit is the number of new runs; if the number changes significantly from an established average, the technician can consult with household members to assess the source of discrepancy. A filter-use tracking system has the added advantage of simplifying the process of gathering data on use, should GWI ever decide to carry out a program evaluation for any purpose.
3.2.5 Record-keeping

There is a range of difference in the kinds of records being kept at each project site. In his August 1999 trip report, Bill Gallo notes that each of the then-four technicians in Les Palmes, which at the time had about 400 filters, maintained a list of the houses in his circuit, but no central list of project households existed, or could be found at the time. In the same report, he suggests the use of uniform blank forms for all technicians, to facilitate the record-keeping process. Gallo’s trip report from October 1999 indicates that the central list problem was solved, but that it also brought to light the fact that well over fifty filters of the initial four-hundred shipment were unaccounted for. During my trip to Haiti, I noticed that not all technicians were using these forms; for the most part, the technicians were using notebooks, but some technicians were writing on pieces of paper that did not seem to have complete information on their circuits or households. Buckets were labeled with a circuit- and household-number in most places, but this practice was not uniform. Technician and project monitoring would likely be simplified by some degree of uniformity in practice across sites. I recommend that blank forms, bound into a notebook, be provided to every technician. The forms should contain columns for collecting information by circuit- and household-number – which all buckets should be labeled with – on chlorine presence results for the top and bottom buckets, and number of filter runs, if the sticker label system suggested above is being used. The book should also have an index that lists circuit and household numbers along with their corresponding household names. A brief description of household location might be desirable, but difficult to provide.

Other than providing uniform and comparable information about the progress of each project site, good record-keeping might also help dissuade technicians from falsifying records, particularly if records are required to be presented in Dumay as a condition of pay. Copies of these records, kept in Dumay over say a six-month period, could also be compared to results obtained from random testing procedures. Sustained significant differences between the two sets of results might provide grounds for technician dismissal.
4.0 Program Sustainability

Program sustainability is quickly becoming a critical objective for GWI’s projects, particularly as demand for filters continues to grow, programs get older and more settled, and the economic condition of Haiti’s rural poor remains uncertain. Sustaining current community sponsorship levels, which cover all community project costs save chlorine purchase, over the long term is difficult at best, and new methods of financing project costs need to be explored.

In addition to fiscal incentives for developing program sustainability scenarios, there are a number of development-oriented reasons for creating mechanisms to enhance the financial and managerial self-sufficiency of programs. First, the ability of programs to become self-financing means that GWI can retain a greater degree of autonomy, hence a greater chance of project success, in site selection, because alternatives to donor financing are available. Second, it gives GWI the ability to extend its filter program to a larger number of people. Third, a self-financing mechanism builds its own layer of accountability into a system – people are more likely to correctly utilize something that they consciously pay for, and will ensure, too, that technicians perform the tasks they are required to perform. Fourth, and more importantly, moving to a self-financing scheme encourages self-reliance, and places the program further in the hands of local community members. It also sets the stage for the development of additional collective projects, allowing the local community in general, and the water committee in particular, to develop its own management and training capacity so that it can become an effective motivator of change agents in the community and catalyze further development (Aga Khan Foundation, 2001).

A number of program sustainability strategies are already in place – moving some of GWI’s filter assembly functions from the factory in Florida to a new one in Dumay enables local production of filters, and builds additional forms of capacity. The organization’s recent exploration of in-country hypochlorite generation is another step in the right direction (Van Zyl, 2001). Full program sustainability, however, will require paced shifting of responsibility for project costs from GWI to the households that benefit from the filter program. It will also require the creation of some form of bill collection mechanism, as well as disincentives for defaulting on project cost payment.

Popular resistance to setting up cost-recovery or any sort of financing mechanisms for servicing the poor includes concerns about their willingness and ability to pay for services. Whittington et al. (1990) and Okun (1992) dispel this myth using a number of examples that prove that, for the most part, the poor can and do pay for water services. In fact, they often pay a larger amount and a higher proportion of income for such services than their economically better-off counterparts living in areas served by piped networks (Whittington et al., 1990; Whittington 1991; Whittington et al., 1992, Okun 1992). While in Haiti, I had neither the resources nor the time to conduct conventional contingent valuation surveys (which tend to provide problematic indications at best), but an informal survey of project household members revealed that a large number of households purchase a small amount of water daily. Purchase amounts increase during the dry season, but it appears that on average most households tend to purchase five gallons of
water per household per day, at a cost ranging between 3 and 5 gourdes per 5-gallon bucket. Household expenditures on water therefore range from approximately $0 to $25 Haitian per month, depending largely on seasonable variables. This indicates at least some amount of elasticity in price-demand for water.

One of the largest ongoing project costs is technician salaries. Monthly local community technician salaries range from $200 to $300, depending on whether a technician has passed GWI’s certification process or is still in training, and on a salary level decision made by the local water committee. Two out of the three Master Technicians, Wilberne and Remis, make $400, and the third Master Technician, Emmanuel, who directs training programs, makes $450. In new committees, two technicians serve 50 projects. Once a community program is on its feet, roughly three new technicians are brought on board for every 200 filters added. Technician load levels therefore range from about 25 to 70 households. It is GWI’s goal that every technician be able to service 250 households, once a program is established, communities know how to and consistently use the filters accurately, and technicians are trained and experienced – the actual ability of a technician to cover 250 households would depend on project household cluster patterns. If responsibility for technician salaries, at an average figure of $250 for simplicity’s sake (for the purposes of this option exploration) were shifted entirely to project households, the households would have to pay between $1 and $10 per month, depending on technician load levels. That would increase monthly water expenditures to $1 to $35 per household. This figure does not include chlorine purchase expenditures, which fall between $1 and $2 for an average Haitian household. By comparison, the cost of bottled water, available in urban areas and larger centers, for similar consumption levels would range around $120 (Dieudonne, personal communication). When people develop an awareness of the relationship between water and health, even in rural areas, they are willing to pay for bottled water. In fact, GWI will not site a project in areas where bottled water is readily available (Phil Warwick, personal communication). This fact indicates that willingness and ability to pay for water might be relatively high, caps at $120, and depends strongly on community education and social marketing endeavors.

Moving from the current practice of close to full project subsidization to charging households for services is not a simple task. Project households will need to be informed of the change in advance, convinced of the need for such a change, and given plenty of time to communicate their concerns and provide input into the specific phasing of cost shifting. The cost shifting is more likely to work if people actually receive a tangible product in return for their payments, rather

---

7 5 gourdes make $1 Haitian. The Haitian dollar tends to fluctuate at a currency exchange rate of roughly 4:1 to the US dollar. At the time of our Haiti visit, $1 US was roughly equivalent to 22 gourdes. All dollar figures from this point on will be Haitian dollars, unless otherwise specified.

8 For the sake of comparison, a good (higher level) salary for a local teacher ranges around $170 Haitian/month. GWI’s salary, therefore, is competitive and generous. The technician positions are intended to be full-time day jobs.

9 Similar transitional situations do not appear to be well documented in the literature; the recommendations provided, therefore, are an attempt to synthesize good practice drawn from a range of sources. We have also attempted to think through the ways in which the move to cost recovery might fail, and provide suggestions for preventive measures for the same.
than service-oriented visits from a technician. For this reason, it is desirable to lump chlorine, parts, and technician service into a basket of products that the households pay for, rather than simply technician service. Consequently, technicians will also need to take on the responsibility of distributing chlorine. Monthly charges for this basket, assuming that GWI continues to initially subsidize the cost of parts, will range between $2 and $12, the cost of technician salary plus chlorine. I recommend that GWI begin phasing cost transfer at the point where each technician is able to service one hundred households, but no later than 18 months into a particular project, at a monthly cost to households of around $5, a figure that seems affordable given current practice. The exact figure to charge will vary, depending on technician salary levels in the area, and on what GWI and the local water committee decide is an appropriate float buffer to cover additional unforeseen project costs. As additional savings are realized from increasing technician load levels and from local chlorine production, the community can also begin to assume responsibility for the cost of parts. Excess funds, if there are any, could either be returned to households at the end of the year, used by the water committee to invest in communal water resources, or be provided as incentive bonuses to technicians who perform above expectations.

In a country where disposable income is low and income streams are uncertain, it is necessary to explore mechanisms that will assist and encourage households to make regular and timely payments, without which any self-financing scheme is likely to fall apart. In this case, if technician payments become irregular or uncertain, technician retention could become a concern. While the actual figure to charge households can and will vary from site to site, depending on local conditions, a similar self-financing framework can be adopted for each site. Much of the literature in the area of self-financing mechanisms for water supply and treatment projects focuses on capital cost recovery on and operation and maintenance for capital-intensive and often centralized, or at least community-wide, treatment systems. Consequently, I have drawn lessons and ideas from a range of self-financing mechanisms, including those used for women’s micro-credit schemes and small-scale agricultural assistance programs, which have more in common in scope with GWI’s programs. Some improvisations have been made on water-related self-financing mechanisms to come up with a sustainability scenario that makes sense for the particular circumstances of the program in Haiti.

Based on a review of farmer cooperative practices, Coulter et al. (1999) identify four elements for discouraging default on program payments:

- Lending through groups
- Good communication and close monitoring
- Range and quality of services offered
- Incentives for repayment, and strict treatment of defaulters

Session proceedings of the Governing Body of the International Labor Organization (1994) further indicate that the sustainability of self-financing schemes and mutual-savings based organizations depends on:

- reciprocal trust and supervision among members/borrowers
- their location near users [accessibility]
• transparency and ease of management
• Good communication of rules

The above factors need to be enveloped within the design of any financing mechanisms for GWI programs. Group-based or group-insured financing, the basic gamut of most micro-credit organizations and rural cooperatives, works by creating a system of peer pressure, where the actions of an individual affect a group’s ability to gain future financing. For the group-pressure system to function, there must be clear, understandable, and agreed-upon rules about individual and group expectations and abilities, as well as some degree of reciprocal trust or self-interested cooperation among the group’s members. Monitoring of individual member activities with regards to group resources must be transparent to all members of the group, and strong incentives or disincentives must exist to reward or reprimand individuals who act outside a group’s interest.

The Massachusetts Water Resources Authority (MWRA) employs an interesting and importable self-enforcing financing insurance mechanism. The 43 communities that purchase sewage services from the MWRA each pay a small fee in addition to their monthly water charges. This fee is collected into a central account, which can then be drawn from to cover charges if a particular community does not make its monthly payment by a pre-established date. This fact is announced to the fund contributors. To keep the fund at a constant level, each community is then charged a little extra the following month (MWRA, 1990). Naturally, if say the city of Chelsea were to default on its monthly payment to the MWRA, it would face a tremendous amount of pressure from upset politicians in 45 other communities. To date, no MWRA-served community has defaulted on its water bill payments, despite a rapid quintupling of user charges. A variation on a similar self-enforcing, self-insuring funding mechanism could be created for GWI’s project communities.

I recommend that households be grouped in units of no larger than 25 households to form a single self-financing unit that pools together funds in the same way that the MWRA communities do. Ideally, the households within the unit should be clustered close together, and household members should know one another to some degree. Each household should nominate one member to act as its representative in the unit – the experience of micro-finance organizations indicates that all-female groups have a higher rate of project cost recovery than all-male or co-ed groups. Every few months, the unit members should elect a treasurer, who will be responsible for collecting GWI’s fees from the unit households each month, maintaining and monitoring the unit’s central fund pool, and paying technicians by a certain date. As a unit’s central fund pool builds up, the unit may decide to loan money to a household at a certain interest rate as an alternative measure to requiring all households to pay in extra, if a particular household has a genuine need for such a loan. The fund may also be used for other water-related activities within the units: paying for a cistern fill from a water-vending truck, for instance. In addition to the group pressures and opportunities created by organizing such financing units, this framework also creates a simple structure for rate collection – rather than having to collect individual household payments from the 250 households he or she serves, a technician simply collects ten payments from designated persons from each of the self-financing units. Moreover, because this system makes a technician directly accountable to households he is required to service, there is less likelihood that that a technician will skip out on his responsibilities, or falsify progress results, a practice that is presently suspected in a few cases.
In this self-financing scheme, the water committee acts as a final arbitrator. A self-financing unit may, after giving it a pre-specified number of chances to shape up, report a household that repeatedly defaults on its payments to the water committee. The committee should then decide on an appropriate sanction for that household; in extreme cases, a household’s filter can be taken away and allocated to another household that is willing to take on the responsibility it entails. The severity of this action strongly depends on how valued the filters are, which in turn is a function of the effectiveness of social marketing and community education carried out by GWI. A highly visible program is also likely to attach status value to owning a filter, thereby increasing the chance that households will value the system enough to consider paying costs associated with its use a priority.

While creating this structure undeniably invents an additional layer of complexity in an already elaborate program, its benefits are well worthwhile. The suggested framework provides two established layers of security against non-payment: peer pressure, and loss of service. The latter is relied upon solely as a last resort measure, because it runs counter to the primary goal of providing people with safe drinking water. It is my sense that these mechanisms will work to some degree, but will probably require local adaptation. I recommend that pilot projects be initiated, perhaps using a couple of different self-insuring mechanisms in different segments or clusters of either Dumay or Les Palmes, where projects are more established. Dumay, as GWI’s headquarters, might be an ideal site to start with. I also recommend starting a small pilot project where technician salaries are funded entirely by the local community, ideally in a site that is close to an existing site. Meillac, Madame St. Ville’s village just outside Ferrier, might provide an ideal site for such a pilot, simply because it will be able to draw on support from the well-established program in Ferrier, and can be supervised to some degree by the capable hands of Marie Marthe Francois and Suzette, the Ferrier community technicians. Program setup and requirements for that site should be no different than those for conventional sites.
5.0 Conclusion

The purpose of this project was twofold: First, I intended to develop a set of project guidelines that draw upon the successes and challenges GWI has encountered in its six years of operation in seven different project sites in Haiti. Second, I hoped to develop the beginnings of an effective strategy that would allow GWI to share the burden of project costs with participating households over time, slowly weaning projects off donor funding and creating channels for the development of financially and managerially self-sustaining projects.

My program implementation recommendations span the program setup stage through GWI’s provision of sustained support to project communities and their technicians. I recommend that GWI exercise higher selectivity in site selection and play a stronger facilitative and advisory role during the project setup stage, from guiding water committee member and technician selection to suggesting tighter patterns of filter distribution. Hiring a staff member who is fluent in the local language and can be present through this vital stage is an important factor in ensuring effective project setup that can pave the way for improved performance. I suggest improvements in technician support, ranging from timely payment to better route management within tighter household clusters, monitoring and continuous community education.

The program in Haiti has begun to establish firm roots and sow the seeds for its own growth, as well as that of local capacity in the communities that is serves. The program sustainability scenarios are designed to provide GWI with an avenue for better managing and channeling its growth, and to help create an effective exit strategy for GWI, a necessary component of any sustainable development project that intends to build and catalyze local capacity. For about a $5 monthly cost, which includes the cost of chlorine and technician service, GWI can begin to shift the lion’s share of its project costs to households participating in the filtration program. A self-insuring, self-enforcing group-based cost collection mechanism helps provide the necessary structure to ease cost collection and reduce default on payments. In addition to building local self-reliance and control, this project frees up GWI’s resources so that the program can be expanded to other communities without the need to conduct ever-increasing fundraising efforts. More importantly, it places the project further in the hands of local people, and allows the community to take control of its own destiny.
References


Levy, P. Class Notes. 11.362 Environmental Management. Spring 1998. Massachusetts Institute of Technology


MWRA Prospectus, January 1990.


