

customers and cuts distribution costs for manufacturers.

- Minimize the technical complexity of products. Simple products are less likely to break down or require outside maintenance. They should be designed so that users can easily and cheaply maintain them.
- Maintain high standards of quality. Durable, well-designed, and well-made products require less frequent repairs and servicing.
- Issue product warranties. Warranties reassure consumers about the life of the product and future costs, but they are useless unless repair services are readily accessible.
- Encourage retailers, including rural micro-entrepreneurs, to offer after-sales services. Retailers can be trained to make simple repairs or replace damaged parts. This is convenient for customers.

Conclusion

While challenges remain, this research reveals great opportunities for businesses making and marketing HWTS products for low-income households in India. Commercial firms, often acting in partnership with NGOs and MFIs, have demonstrated that they can generate demand for HWTS by raising awareness of the dangers of unsafe water and promoting the health and social benefits of their products. Affordable pricing is key, however, since the cost of buying and operating a HWTS product is a major concern for low-income families. Manufacturers should also consider taking aim at markets outside the home, including children attending school and agricultural laborers working in the fields.

The news from the supply side is equally promising. Indian companies have developed and

tested many innovative approaches to distribute and market products to hard-to-reach rural households. Some have already been adapted to HWTS sales, while others—such as networks of rural micro-entrepreneurs—show great promise for the HWTS sector. It is becoming clear that commercial manufacturers with an appropriate, affordable HWTS product have the potential to effectively reach low-income households living in rural areas and that it may be necessary to build a separate, specialized supply chain to do so.

This is part of a series of project briefs discussing the activities, research findings, and field experiences of PATH's Safe Water Project.

JANUARY 2009

Supply and Demand for Household Water Treatment Products in Andhra Pradesh, Karnataka, and Maharashtra, India



PATH/Greg Zwisler

A boy sells fast-moving consumer goods at a village kiosk.

Background

The Safe Water Project launched by PATH in 2006 is exploring how the private sector can help meet the need for safe drinking water in developing countries by piloting distribution methods, developing marketing strategies, and influencing product design for affordable household water treatment and storage (HWTS) products. In India, which is the project's initial country of focus, a rapidly growing economy is beginning to raise both the standard of living and the

expectations of low-income families. At the same time, commercial businesses have developed successful, sustainable models for selling a wide variety of goods and services to low-income households, especially in rural areas. These developments have expanded the distribution and sales opportunities for commercial manufacturers in the HWTS sector.

To better understand the current market dynamics, PATH commissioned research on the demand for HWTS products

This issue was written by Adrienne Kols and designed by Dave Simpson and Scott Brown.

♻️ Printed on recycled paper

Copyright © 2009, Program for Appropriate Technology in Health (PATH). All rights reserved. The material in this document may be freely used for educational or noncommercial purposes, provided that the material is accompanied by an acknowledgment line.

www.path.org



MAILING ADDRESS
PO Box 900922
Seattle, WA 98109 USA
STREET ADDRESS
2201 Westlake Ave. Suite 200
Seattle, WA 98121 USA



and on supply chains serving low-income consumers in three states: Andhra Pradesh, Karnataka, and Maharashtra. The 2008 study was conducted by an India-based consulting firm, Intellecap, which focuses on institutional capacity building and investment in the development sector. The Safe Water Project team will use the research findings to identify promising supply chain models, develop innovative distribution and marketing strategies, and inform product design

Research Methods

Investigating potential customers

Researchers conducted ten focus group discussions (FGDs) with low-income consumers and potential consumers of HWTS products. All six FGDs in Andhra Pradesh and both FGDs in Maharashtra took place in rural areas; the two FGDs in Karnataka were conducted in peri-urban locations. Each FGD involved 15 to 25 participants, for a total of 210 in all. Participants in nine of the FGDs were women; one FGD in Andhra Pradesh consisted solely of men. Most participants were seasonally employed as marginal farmers and agricultural laborers. Their average monthly household income ranged from Rs 1,100 in Latur, Maharashtra, to Rs 8,300 in Manickapuram, Andhra Pradesh. The FGDs explored participants’ access to and sources of clean water, their awareness of the health hazards of drinking contaminated water, and their knowledge and likelihood of using various HWTS products.

Analyzing the supply chain

Researchers examined the production, distribution, and marketing of HWTS products by:

- 1. Conducting individual interviews with a diverse set of industry players based in India, including one academic expert, six corporate manufacturers, two wholesalers, four retailer/distributors, and seven representatives from government, non-governmental organizations (NGOs), and development-sector agencies.
- 2. Mapping the supply chains of six products marketed to low-income consumers, including fast-moving consumer goods (FMCGs), household durables, and consumable replacement parts (Table 1). All of the products selected were priced affordably, could meet the needs of low-income consumers, displayed innovation either in the product or the distribution system, and had a large-scale presence in the Indian market or the potential to be scaled up nationwide.
- 3. Conducting observations at ten urban, peri-urban, and rural retailers in Andhra Pradesh that

sell HWTS products, including general household goods stores, electronics stores, and specialty outlets.

- 4. Conducting three FGDs and six individual interviews with experienced rural micro-entrepreneurs who demonstrate a high potential for introducing new products to consumers. Entrepreneurs were selected because they participate in successful rural marketing ventures, have experience with microfinance, recognize the value of diversifying the products and services they offer, and are interested in addressing consumers’ needs for follow-up services as well as making initial sales.

Findings on the demand for HWTS products

Access to safe drinking water

Borewells are the primary source of water at the FGD sites. None of the sites is connected to a surface water

Product design and effectiveness

Low-income rural consumers have different needs and preferences than other market segments. To ensure that HWTS products are appropriate for their circumstances, corporate manufacturers should consider the following strategies:

- Design products that do not require a dedicated water supply or electricity. Many rural households rely on community taps and lack electricity.
- Design products to prevent recontamination of stored water. Water should be dispensed through a tap, and the inlet should be wide enough to reach in for cleaning but too narrow to dip in a serving cup or utensil.
- Customize products to different niches. A series of products can address specific concerns of different markets, such as local contaminants in the water or the need for safe water at schools or in the fields.
- Consult development agencies, NGOs, and local micro-entrepreneurs. Their firsthand knowledge of rural consumers can help manufacturers design new products and refine existing products to better meet consumer needs and preferences.
- Seek input from consumers. Manufacturers should involve consumers in product design and testing and collect customer feedback regarding existing products.

Pricing strategies and financing

Low-income consumers in rural areas are not used to spending much on water or preventive health interventions. They have little discretionary income, and their income varies from month to month. To make HWTS products more affordable, manufacturers should consider the following strategies:

- Set prices low. According to NGO interviews, HWTS products targeted to low-income rural households should cost no more than Rs 1,500. Offering FMCGs in smaller packages, at lower prices, may also appeal to low-income households.
- Focus on long-term savings. Over time, certain HWTS products are much less expensive than others—and all are cheaper than buying purified or packaged water.
- Offer seasonal discounts. Timing discounts to coincide with seasonal earnings can increase sales.
- Offer volume discounts to distributors and retailers. This not only drives down prices, but also gives retailers an incentive to promote sales of a product.
- Bundle replacement parts with HWTS products. This reduces operational costs for consumers. It also reduces distribution costs for manufacturers.
- Target subsidies to low-income consumers. Subsidies can be used to eliminate interest on consumer loans, cut prices in rural areas, or provide free service and maintenance.

- Partner with MFIs. These organizations have experience offering small loans, which are typically repaid in monthly installments over six months to one year.

Distribution and supply

Conventional supply chains cannot serve rural consumers effectively. To create a strong and sustainable supply chain for HWTS products in rural areas, corporate manufacturers should consider the following strategies:

- Create multiple supply chains to serve different market segments. Manufacturers can develop and operate different supply chains for cities, towns, and villages.
- Build a network of rural micro-entrepreneurs. This is one of the most effective and convenient ways to reach consumers in small villages.
- Offer NGOs and development agencies bulk discounts and marketing support. These organizations have an established network of offices and workers in rural areas and may be interested in distributing HWTS products because of their health benefits.

Support and maintenance

Consumers worry about operating, maintenance, and repair costs for HWTS products, as well as access to supplies and parts. To address these concerns, manufacturers should consider the following strategies:

- Bundle supplies and replacement parts with HWTS products. This is convenient and inexpensive for

with the goods that they typically sell.

Rural micro-entrepreneurs also can offer corporate manufacturers the benefit of their knowledge regarding local tastes, preferences, perceptions, and expectations. Their understanding of consumer needs and preferences can help designers customize HWTS products so that they appeal to rural consumers. Micro-entrepreneurs can also help devise effective marketing strategies for low-income consumers.

Implications for marketing HWTS products

Corporate manufacturers face significant risks in entering the market for HWTS products targeted to low-income rural households. They must bear the extra costs of creating demand where little currently exists and of reaching out to geographically dispersed and difficult-to-reach populations. However, this research suggests many effective strategies that manufacturers can use to create demand for HWTS, design more appealing products, make HWTS products more affordable, create a strong and sustainable supply chain, and build a viable support and maintenance system.

Demand creation and marketing

Lack of awareness that contaminated drinking water causes common illnesses, including diarrhea and joint pains, limits the demand for HWTS products in rural areas. To create awareness of waterborne disease and promote HWTS



PATH/Glen Austin

Families often don't use HWTS products because they perceive their water to be safe.

products, corporate manufacturers should consider the following strategies:

- Conduct awareness campaigns. General education about the harmful effects of contaminated drinking water can pave the way for specific product promotions.
 - Offer water testing. People are more likely to consider HWTS products if they realize just how contaminated their drinking water is.
 - Involve community leaders. Thought leaders such as the Panchayat and self-help groups can act as a catalyst in the decision-making process for HWTS products.
 - Partner with development agencies and NGOs. These organizations have credibility and connections at the grassroots level, as well as a proven track record in educating people about health, hygiene, and sanitation issues.
 - Partner with rural micro-entrepreneurs. These agents are ideally placed to raise awareness
- of water issues, introduce new technologies, and influence household decision-making.
 - Partner with the health system. Health professionals are a credible source of information on water issues, while patients are a receptive audience. The network of government primary health centers provides a way to reach people at the village level.
 - Encourage positive word of mouth. Local opinion—especially from people who have used HWTS products—can have a big impact on demand in rural areas.
 - Employ local media channels. Manufacturers can tailor advertising on local television, radio, billboards, and other channels to the language, needs, and preferences of the community.
 - Go beyond the health benefits of HWTS. Some people are motivated to buy HWTS products for their potential social benefits or for their ability to improve the taste and turbidity of water.

supply. At some sites households collect water from hand pumps connected directly to the borewells, which are generally located one or two kilometers away from the village. The water is not treated at the source and may be further contaminated during the trip home—either by dust or by contaminated earthen pots or plastic or steel containers used to carry and store the water. These containers are not always cleaned beforehand or used exclusively for clean drinking water.

At other sites Panchayats (village assemblies) pump water from borewells into a community storage tank, where it may be treated with chlorine before being piped to household or community taps. Certain villages have benefited from partnerships with NGOs, such as the Byrraju and Naandi Foundations, to construct community water purification systems operated by local residents. Villages located on the outskirts of towns may have access to municipal water supplies, which pass through a centralized treatment plant.

Overall, about half of FGD participants have individual water connections in their homes, while the rest rely on community taps. Water is available 24 hours a day at six FGD sites, but only 1 to 3 hours a day at the other four sites, all of which are located in Andhra Pradesh.

Even when the water is treated, the process used may not remove chemical impurities. According to India's Ministry of Water Resources, fluoride, nitrates, and arsenic contaminate the groundwater in some districts of the three states included in the study, and salinity also poses a problem in

some locations.¹ Each of these contaminants has been linked with health problems, but FGD participants were most likely to be aware of the joint pains and bone disorders associated with fluoride. Other water problems at FGD sites include excess turbidity and contamination with pathogens that cause diarrhea and other illnesses.

Poor sanitation and hygiene contribute to further contamination of water with pathogens during storage and consumption. Most FGD participants store drinking water in clay pots, and they may dip unclean utensils and hands into the water when serving it. Only a few households have pots fitted with a tap to dispense water hygienically.

The problem of safe drinking water extends beyond the home. As mentioned above, the majority of FGD participants work in farming. They spend most of the day in the fields, with no access to safe water. Most FGD participants also have one to three children in school, and the schools often lack a source of safe water for students and staff.

Awareness of waterborne disease

Overall, the FGDs revealed little awareness that contaminated drinking water causes common illnesses, such as diarrhea and joint pains. There have been no government-organized educational campaigns on the importance of safe water at these sites. However, where an NGO or corporation has raised awareness of the link between drinking water and disease (see box on following page), consumers are more likely to explore solutions to the problem. For example, World

Vision, working with Eureka Forbes, has established a community water treatment plant at one of the two FGD sites in Warangal, Andhra Pradesh, and is in the process of developing a second plant at the other site. The project has raised awareness of high fluoride levels in the water and its health impacts. After seeing the health benefits of the first treatment plant, nearby villages have begun requesting similar plants.

The perceived benefits of HWTS are also driving consumer behavior at an FGD site in Medak, Andhra Pradesh. HUL conducted safe water awareness campaigns in Medak when it piloted Pureit, a tabletop water purifier. Pureit does not remove fluoride, which is a leading problem in Medak and the main cause of joint pains. However, Pureit users in the FGD claimed that using the purifier had improved their health, and one-fifth said their joint pains had diminished or disappeared.

Knowledge and use of HWTS products

Most FGD participants do not treat their water, but they are widely aware of two traditional treatment methods: boiling and filtering water through cloth (Table 2). However, they tend to use these methods temporarily and only in response to a perceived need: they use cloth filters when water becomes turbid during the rainy season and boil water in response to the illness of children or other family members. Both methods are considered time consuming, and people also dislike the way boiling changes the taste of water.

The vast majority of FGD participants also know about

¹ Central Ground Water Board, Ministry of Water Resources [India]. State profiles: Ground water scenarios for Andhra Pradesh, Karnataka, and Maharashtra. Available at: <http://cgwb.gov.in/>. Accessed 12/18/08.

Activities to Raise Awareness



Self-help groups can provide women with health information as well as alternative financing for household products.

NGOs, microfinance institutions (MFIs), and corporate manufacturers of HWTS products can play an important role in creating awareness of the link between safe water and good health and in promoting community or household water treatment. Influential community members, including the Panchayat health workers, and leaders of self-help groups, can help disseminate the message and catalyze household decision-making regarding HWTS.

Health education—often linked with a specific intervention—is the most common approach. For example:

- The microfinance institution, Ujjivan, is working with other foundations to offer health education on a range of issues, including hygiene and sanitation, as part of its health care and health insurance program for the urban poor.
- Raising awareness of safe water helps the Byrraju Foundation persuade local officials and villagers to support the construction of community water treatment plants.
- HUL and partner NGOs make presentations on waterborne disease and traditional treatment methods to large gatherings of women, usually leaders of self-help groups, before demonstrating the Pureit water purifier.
- HUL also sets up display boards at doctors' clinics that alert patients to the dangers of waterborne disease and encourage them to inquire about Pureit.

Other companies are using water testing to raise public awareness of the dangers of untreated water. For example, Eureka Forbes has established a network of Aquachek water laboratories and testing facilities in India. Consumers using any brand of water purifier can request a free test for total dissolved solids (primarily salt) from Aquachek. For an additional Rs 300–500, they can also order bacterial tests and further chemical tests. Another company, Ion Exchange, markets easy-to-use test kits that let consumers test their water for a wide variety of contaminants, including *E. coli*, fluoride, and nitrates.

to raise awareness of health issues and frequently conduct product demonstrations. Sometimes when a product is long-established and well-known, manufacturers do not make any special marketing effort and rely instead on word of mouth.

Rural micro-entrepreneurs

Several Indian companies have harnessed the power of rural micro-entrepreneurs to expand sales in rural markets. Micro-entrepreneurs invest their own money (from savings or small loans from MFIs or self-help groups) to become direct sellers of a manufacturer's goods and services. They receive training and support from the manufacturer and earn a profit or commission on every sale. Manufacturers can recruit micro-entrepreneurs directly or through alliances with NGOs and MFIs.

This type of direct sales force offers distinct advantages over traditional distribution channels. Rural micro-entrepreneurs are respected and familiar members of the community, have good interpersonal relationships with

potential customers, and enjoy high levels of trust. Their position in the community gives them direct access to potential consumers. It makes it easier for them to create awareness of new products and to overcome people's doubts about unfamiliar and technologically sophisticated products. Local micro-entrepreneurs are also trusted advisors who can exert a major influence on consumers' decision-making process. Finally, consumers feel more comfortable knowing who they can turn to in case they have service or maintenance issues.

The research focused on members of three networks that successfully market goods and services specifically to low-income rural consumers: SSP Jyotis sells biomass pellet cooking stoves and fuel; Scojo Vision Entrepreneurs market eye care and eyeglasses; and HUL Shakti Ammas sells inexpensive consumer goods and household necessities. In each case, linking with rural micro-entrepreneurs enabled the manufacturer to build a sustainable supply and service chain for rural areas.

Interviews and FGDs with rural micro-entrepreneurs found that they can:

- Design and conduct innovative and effective promotional activities, such as village processions, to raise awareness of new products.
- Educate potential consumers about the health and hygiene benefits of products.
- Market products door to door and at village fairs.
- Help customers arrange for installment payments or loans.
- Train buyers on how to use an unfamiliar product.
- Provide a reliable source of supply for consumables and replacement parts.
- Offer after-sales servicing, either by making repairs themselves or sending products away to be fixed.

These same skills could be applied to marketing HWTS products to low-income rural consumers. Some micro-entrepreneurs, however, are concerned about the relatively high price of HWTS products compared

Public-private partnerships

Partnerships with NGOs, development agencies, and microfinance institutions can help manufacturers reach out to low-income rural consumers. For example, HUL has entered into a strategic alliance with Access Development Services to market Pureit tabletop water purifiers in rural India. Access—and the NGOs and microfinance institutions that are part of its network—play multiple roles in the supply chain. First,

they help conduct health education and awareness raising activities in target communities. Second, they act as distributors and retailers; they assess local demand, place bulk orders for purifiers directly with HUL, and distribute the stock received to village offices and rural consumers. Third, they provide microfinance to low-income rural women so that they can afford to buy a Pureit system.

To reach more customers, HWTS manufacturers also use door-to-door sales, stalls at consumer fairs, and village kiosks.

Observations at HWTS points of sale found that both ceramic candle filters and tabletop purifiers are consistently stocked. However, ceramic candle filters are the only HWTS products with good distribution channels and strong penetration in low-income rural markets. Expensive and technologically advanced reverse osmosis and ultraviolet systems are limited to urban areas. Stores generally stock replacement parts for the products they carry.

Many different stakeholders play a role in the HWTS supply chain—some directly and others indirectly. For example, demand for HWTS products is highly elastic; in other words, sales are very sensitive to pricing. Because tax rates affect the final cost of HWTS products, the government thus indirectly influences the demand for these products. Table 3 describes each stakeholder who has an impact on all or part of the supply chain. Linkages between stakeholders—for example, between manufacturers and NGOs, or between manufacturers and government—have the potential to strengthen the supply chain and increase sales.

Promotional strategies

According to the supply chain analysis, manufacturers direct some of their promotional activities to members of the supply chain. Initially manufacturers may need to market their products to super-stockists and distributors in order to build a strong distribution network.

Table 3. Roles of stakeholders in HWTS supply chain

Stakeholder	Role in supply chain
Academic researchers	<ul style="list-style-type: none">• Influence research and development of HWTS products• Create innovative and customized solutions in response to consumer preferences
Corporate manufacturers	<ul style="list-style-type: none">• Conduct research and development• Determine design of products• Decide on marketing strategies, including product rollouts and niche marketing for selective product types
Wholesalers	<ul style="list-style-type: none">• Link manufacturers and retailers• Maintain stocks of HWTS products based on expected demand• Contribute to sales by increasing number and diversity of retailers
Retailers	<ul style="list-style-type: none">• Drive product sales• Relay consumer feedback to manufacturers
Government	<ul style="list-style-type: none">• Sets tax rates that directly and indirectly affect the final cost of HWTS products• Establishes the regulatory environment• May support educational outreach efforts to rural areas that raise awareness of the importance of safe drinking water
NGOs and MFIs	<ul style="list-style-type: none">• Create awareness of the need for safe drinking water and the benefits of HWTS products• Distribute HWTS products to lowincome rural households• Sponsor loans and installment plans for lowincome consumers
Rural micro-entrepreneurs	<ul style="list-style-type: none">• Raise awareness of the need for safe drinking water• Introduce innovative HWTS technologies• Distribute HWTS products to lowincome rural households
Communities	<ul style="list-style-type: none">• Increase awareness of health, hygiene, and sanitation issues• Influence the decisionmaking process of households considering the purchase of HWTS products
Consumers	<ul style="list-style-type: none">• Determine demand for HWTS products• Influence product design and marketing strategies• Offer feedback on value of products

Wholesalers may need convincing about the extent of demand for a specific product or brand and its profit potential. Once the supply chain is established, manufacturers may use discounts and incentives to drive sales. Offering volume discounts to super-stockists, distributors, and dealers permits them to earn a higher margin or to pass the discount along to customers. In a competitive marketplace, seasonal or other discounts on retail prices can attract more customers. Finally, paying micro-entrepreneurs on commission is a strong incentive for them to sell more.

Other marketing activities are

directed toward end consumers. The manufacturers studied here advertise on national and regional television stations and in newspapers, distribute product leaflets to potential customers, operate telephone help lines to answer consumers’ questions, erect promotional and sales kiosks, and have sales people make cold calls or go door to door. In rural areas, word of mouth and local promotions, such as painting advertisements on walls or organizing village processions, may be more effective than mass media advertising. Partner NGOs, MFIs, and micro-entrepreneurs also play a major role in driving sales of products in rural areas; they work

low-cost ceramic candle filters. However, they are less likely to use them than traditional methods because they do not perceive any benefits.

Awareness of other HWTS methods varies widely among states. All FGD participants in Maharashtra were aware of chemical disinfectants, and some have used them, because relief efforts following a 1993 earthquake distributed liquid chlorine. Participants in Karnataka were also likely to know about chemical disinfectants because officials add bleaching powder to community water tanks, but none had ever used disinfectants at home. By contrast, none of the FGD participants in Andhra Pradesh knew of chemical disinfectants. Disinfectants are perceived as an effective preventive health measure when there is a natural calamity, but people worry that adding chemicals to drinking water may be harmful. They also dislike the way that chlorine alters the taste. According to an FGD with rural micro-entrepreneurs in Maharashtra, families tend to use disinfectants only when there is an illness in the family.

Knowledge and use of two brand-name purifiers, Pureit and AquaSure, depend on local marketing efforts by the manufacturer. As a result, none of the FGD participants in Maharashtra are aware of either purifier, while AquaSure is widely known in Karnataka and Pureit is widely used in some parts of Andhra Pradesh.

Motivations for buying an HWTS product

The overwhelming factor driving demand for HWTS products in six

Table 2. Number of FGD participants who know of and use specific HWTS methods, by state

HWTS method	Andhra Pradesh (N=125)		Karnataka (N=45)		Maharashtra (N=40)	
	Knowledge	Use	Knowledge	Use	Knowledge	Use
Boiling or cloth filtration	85	31	45	4	40	20
Ceramic candle filters	105	19	45	10	40	10
Chemical disinfectant	0	0	30	0	40	15
Pureit	20	20	5	3	0	0
AquaSure storage purifier	0	0	25	2	0	0

Note: Use includes current use or use within the past year for all methods except chemical disinfectants. Use of chemical disinfectants includes any current or past use.

of the ten FGDs was the potential for health benefits. Consumers who are aware of the link between drinking water and disease are more likely to consider water treatment. This is supported by HUL’s experience in marketing Pureit: raising awareness of the link between water contamination and disease helps drive sales.

In the remaining four FGDs—all conducted in rural areas—the main factor driving demand for HWTS products was the possibility of improving the households’ social status. Participants viewed HWTS products as a household asset and status symbol in the rural class system. For example, FGD participants who owned a Pureit reported that social aspirations were a primary reason for making the purchase.

The FGDs also identified three less important factors that may motivate some people to consider purchasing HWTS products. These include the poor taste of water, visible dirt in the water, and the convenience of HWTS solutions.

Decisions to purchase a HWTS product are made jointly by the family, often after consulting other households that are already using the product. Women frequently are the first ones to learn about HWTS products. The FGDs did not find any evidence that children are helping raise awareness of safe water issues.

Willingness and ability to pay

The FGDs suggest that low-income rural households may be reluctant to spend money on treating drinking water. These households generally set aside little or no money for health needs. Health-related expenditures are mostly prompted by medical emergencies; they are not preventive, as would be the case for HWTS products. In addition, households are used to spending very little money, if any, for water. FGD participants reported spending as little as Rs 12 and no more than Rs 50 monthly on water.

The sheer cost of durable goods for HWTS, compared with average household income, may make them unaffordable for many low-income families. High operational and

maintenance costs add to concerns over the initial price. In the top five FGDs by income, the price of a durable HWTS product equaled:

- 10% to 13% of average monthly household income for the cheapest products on the market, such as on-tap water purifiers and ceramic candle filters, which retail for about Rs 800.
- 24% to 32% of monthly income for moderately priced products, such as tabletop water purifiers, which retail for about Rs 2,000.
- 72% to 96% of monthly income for the most expensive products, such as reverse osmosis systems, which sell for Rs 6,000.

Participants in the other five FGDs had far lower monthly incomes, making durable HWTS products an even greater financial burden. In the poorest location (Latur, Maharashtra) the price of even the least expensive HWTS products is almost three-quarters of average monthly household income. Moderately priced HWTS products cost almost twice as much as monthly earnings, and the most expensive products cost five times more than monthly earnings. Chlorine disinfectants are much more reasonably priced—selling for as little as Rs 20 for a 30-ml bottle of Medisor-M at pharmacies in Maharashtra. This makes them far more affordable for low-income families, even though it is an ongoing rather than a one-time cost.

Recognizing that many rural households cannot afford to make a lump-sum payment for a HWTS product, some leading HWTS manufacturers have partnered with MFIs to permit households to spread payments over time. HUL is working

with Access Development Services to offer a loan-backed purchase option for Pureit purifiers.

Product design issues and preferences

The FGDs revealed several challenges in the design of HWTS products for rural, low-income households. First, products need to be customized in response to the local situation. Often this means no electricity and no direct water connections. Specialized technology may also be required to remove specific contaminants. For example, 90% of FGD participants in Nalgonda, Andhra Pradesh, have experienced or are aware of health problems associated with fluoride contamination. However, there are no affordable HWTS products on the market that can remove fluoride and do not require electricity.

Second, a home-based system may not be a convenient or effective way to supply the entire family with safe drinking water. It is impractical for farm workers and schoolchildren to carry enough drinking water with them to meet their needs away from home—a problem highlighted in one of the FGDs conducted in Maharashtra. About half of the participants in this FGD reacted positively to the idea of a convenient, portable, on-tap purifier that could be used by farm workers, schoolchildren, and women collecting water from community taps.

Finally, some FGDs in Andhra Pradesh found a preference for community-based water treatment. Participants were not interested in HWTS products, mainly because of the recurring costs and regular maintenance required.

Findings on the supply, distribution, and marketing of HWTS products

The HWTS supply chain

Figure 1 illustrates current and potential supply chains for HWTS products identified by the supply chain mapping exercise. Each of the six manufacturers analyzed—all of whom market their products to low-income Indian households—has developed a distinctive marketing and distribution strategy based on the nature of the product and the consumers targeted. Several of the manufacturers employ multiple distribution models in order to reach different segments of the market. For example, a company may use conventional wholesalers and distributors to supply retail stores in cities and towns, while partnering with local NGOs or rural micro-entrepreneurs to reach rural areas.

Corporate manufacturers are the first link in the chain. They are responsible for research and development, either conducted in-house or in collaboration with academia and government. All of the companies included in this study manufacture HWTS products at their own factories in India, but it is possible to contract out production. Corporate manufacturers also decide on marketing strategies and advertising campaigns to promote the products.

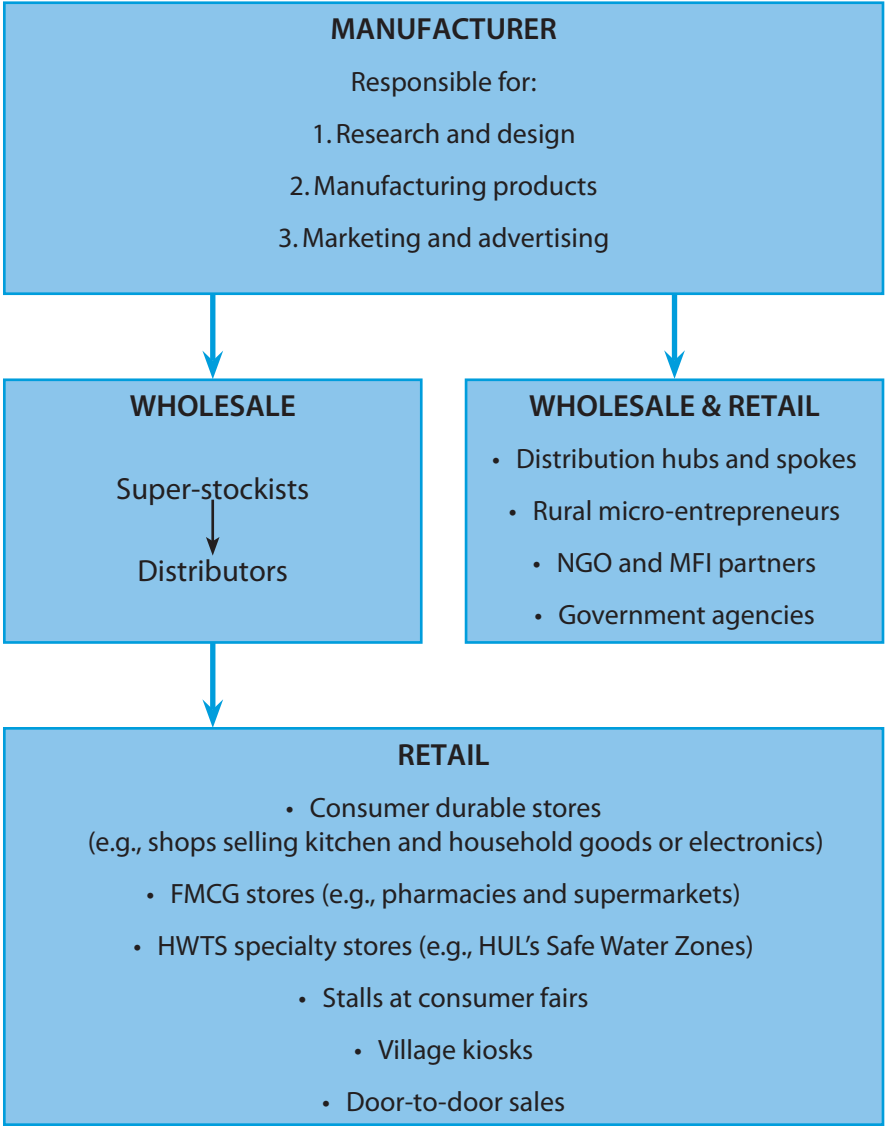
At the wholesale level, manufacturers generally appoint super-stockists to service a few districts within a state. Super-stockists supply distributors who, in turn, supply retailers. Super-stockists (and their distributors) may carry HWTS

products, replacement parts, or both, depending on the amount of investment required and the manufacturer’s distribution and sales strategy. Where there are separate supply chains for a product and its replacement parts, retailers must deal with more than one distributor. On occasion, manufacturers may choose to bypass wholesalers and supply stock directly to retailers; some have regional sales depots that supply both wholesalers and retailers. Sometimes the public sector acts as a distributor as, for example, when a state health department or village Panchayat places a bulk order for a chemical disinfectant and distributes it to households at risk.

Several HWTS supply chains blur the distinction between wholesalers and retailers. For example, HUL uses a hub-and-spoke model to reach rural areas. The “hub” both distributes products to the “spokes” and also functions as a retail point-of-sale. Urban stores selling HWTS durables and replacement parts also may have dual operations. While they are located in municipally designated wholesale markets, they are easily accessed by the retail public.

The distinction between the wholesale and retail levels also disappears when HWTS manufacturers enlist grassroots organizations, such as NGOs and MFIs, to increase outreach to rural markets. NGO and MFI partners place bulk orders with the manufacturer, usually at a discount, and then take responsibility both for distributing products to the village level through their network of offices and fieldworkers and also for selling the products directly to rural consumers. India-based producers

Figure 1. Options for HWTS supply chains



of non-HWTS goods and services have pioneered yet another approach that combines wholesale and retail activities, and it holds great promise for marketing HWTS products in rural areas. They have built networks of rural micro-entrepreneurs to act as the primary distributors for their own and neighboring villages, in addition to making direct sales to customers.

Retailers are the final link in the supply chain. In rural areas, HWTS

durable goods are retailed at stores selling electronic goods, where they exist, and at steel stores. In urban areas, HWTS durable goods are sold at general stores that sell basic kitchen and household items, such as cutlery, light bulbs, and fans, and also at stores selling electronic goods. In large enough towns and cities, manufacturers may establish specialty retail outlets, such as HUL's Safe Water Zones. In contrast, chemical disinfectants are sold at pharmacies and other FMCG outlets.