Creating Access to Credit for Water and Sanitation Improvements: A Case Study of Women's Self-Help Groups in Tiruchirappalli, India

H. Arney*, M. Meckel** and A. Barenberg***

*WaterPartners, 2405 Grand Blvd., Ste. 860, Box 12, Kansas City, MO 64108-2536 (E-mail: harney@water.org)
**WaterPartners, 2405 Grand Blvd., Ste. 860, Box 12, Kansas City, MO 64108-2536 (E-mail: mmeckel@water.org)
*** Department of Economics, Thompson Hall, University of Massachusetts, Amherst, MA 01003 (E-mail: abarenbe@econs.umass.edu)

Abstract
This paper looks at the development of a water and sanitation loan fund deployed through a network of women's self-help groups in Southern India. The success of the loan fund reduced barriers to credit from formal lending institutions and increased investment in water and sanitation facilities. Results from this case study indicate that micro-finance principles can be successfully applied to the water and sanitation sector. The objectives of this case study are to summarize what is known about this loan program and explore the possibilities and limitations of this new financing model for the water and sanitation sector.

Keywords
community-based; micro-credit; sanitation; water; women

INTRODUCTION

Addressing the world's water and sanitation needs is one of the great human development challenges of the early 21st century. Globally, more than 1.1 billion people lack access to adequate safe water, and some 2.6 billion lack access to basic sanitation (Watkins, 2006). In India alone, an estimated 152 million people (14% of the total population) lack access to an improved water source, and nearly 730 million (67% of the population) lack access to improved sanitation facilities (WHO UNICEF Joint Monitoring Programme, 2006).

Lack of access to clean water and basic sanitation facilities creates significant costs in terms of illness and lost time. The United Nations' 2006 Human Development Report estimates the total economic benefits of meeting the water and sanitation targets in the Millennium Development Goals (MDGs) – halving the proportion of people without access to safe water and sanitation by 2015 – would be approximately $38 billion annually (Watkins, 2006). Current grant-based finance models and present aid levels have not provided enough resources to solve the problem. Estimates of amount of investment required vary depending on the methodology, but studies have put the amount to meet the water and sanitation MDGs in the range of 9 to 30 billion US dollars annually (Toubkiss, 2006).

Due to the failure of both the public and private sectors to provide sufficient access to water and sanitation in many developing countries, a decentralized approach to the provision and management of water and sanitation services has emerged over the last two decades (Kähkönen, 1999). At the 1992 International Conference on Water and the Environment in Dublin, conference participants called for a fundamental shift in the assessment, development, and management of freshwater resources. The Dublin paradigm advocated that water development and management should be based on a participatory approach where women play a central role in the management and safeguarding of water, and viewing water as having an economic value in all its competing uses and

should be recognized as an economic good (United Nations Conference on Environment and Development, 1992).

In light of the scarce resources available to the sector and in this new, more decentralized context, there has been a move in recent years to explore alternative finance models for water and sanitation provision. Scattered pilot projects exploring micro-loans for provision of water and sanitation improvements have emerged (Fonesca et al., 2007). For example, CREPA, a water and sanitation-focused NGO, has explored the use of micro-finance mechanisms to extend water and sanitation connections to urban poor in West Africa (Kouassi-Komlan and Foneseca, 2004). WaterPartners, the US-based NGO featured in this case study, has piloted several credit-based models since 2003 in Bangladesh, India, and Kenya.

The concept of micro-finance originated in Bangladesh in the 1970s with the creation of the Grameen Bank. The Grameen Bank revolutionized access to credit for the poor, particularly poor women, by utilizing social collateral requirements to replace traditional economic collateral (Kabeer, 1994). Since that time, the formal micro-finance sector has expanded enormously. In India alone, micro-finance reached 15 - 20 million clients in 2007, covering about 10% of the poor population (M-CRIL, 2007). However, as noted by Agbenorheri and Fonesca, "[Most] micro-finance products are targeted towards income-generating activities rather than water and sanitation which is usually not perceived to be sufficiently attractive by micro finance organizations" (2005, p.1).

This case study explores a micro-lending program carried out in and around the city of Tiruchirappalli (Trichy). Gramalaya, a Trichy-based water and sanitation-focused NGO, implemented this program in partnership with WaterPartners. The program involved the construction of water and sanitation facilities by mobilizing a network of women's self-help groups (SHGs) to utilize a revolving loan fund. Specifically, this case study highlights how the development of a water and sanitation loan fund and the mobilization of women's SHGs were able to reduce barriers to access to credit and increase investment in water and sanitation facilities.

Background

Prior to the program access to improved sanitation in Trichy, Tamil Nadu, was severely limited. Only 36% of the population had access to a basic toilet (Geetha, 2008). Those without household toilets used public facilities or defecated in open areas. Public toilets in urban areas were generally not well maintained, overburdened, and often required a fee. Due to privacy and cultural concerns, women and girls were often unable to defecate during the day, which subjected them to serious health problems and dangerous situations at night. While 90% of the target population was officially listed as having access to water facilities, many of the water systems in the area were overloaded, poorly maintained, or broken. In urban areas, women waited in long lines for water available only during certain hours, on certain days. In most poor neighborhoods, this process took two to three hours. In nearby rural areas, women and children often walked long distances to reach a poor quality water source.

Gramalaya, founded in 1987, works within three regional areas of Tamil Nadu. The population of these three areas totals 1.1 million. The average monthly income in rural areas is approximately $75 and $113 in urban areas. In 2004, Gramalaya began its micro-loan program for water and sanitation improvements. Over the course of the program, WaterPartners provided Gramalaya nearly $200,000 directly into the loan fund and an additional $103,679 to support community hygiene and health trainings, SHG mobilization and training, Gramalaya's operational costs, and capacity building activities for Gramalaya. Prior to this program, Gramalaya had minimal experience with credit-

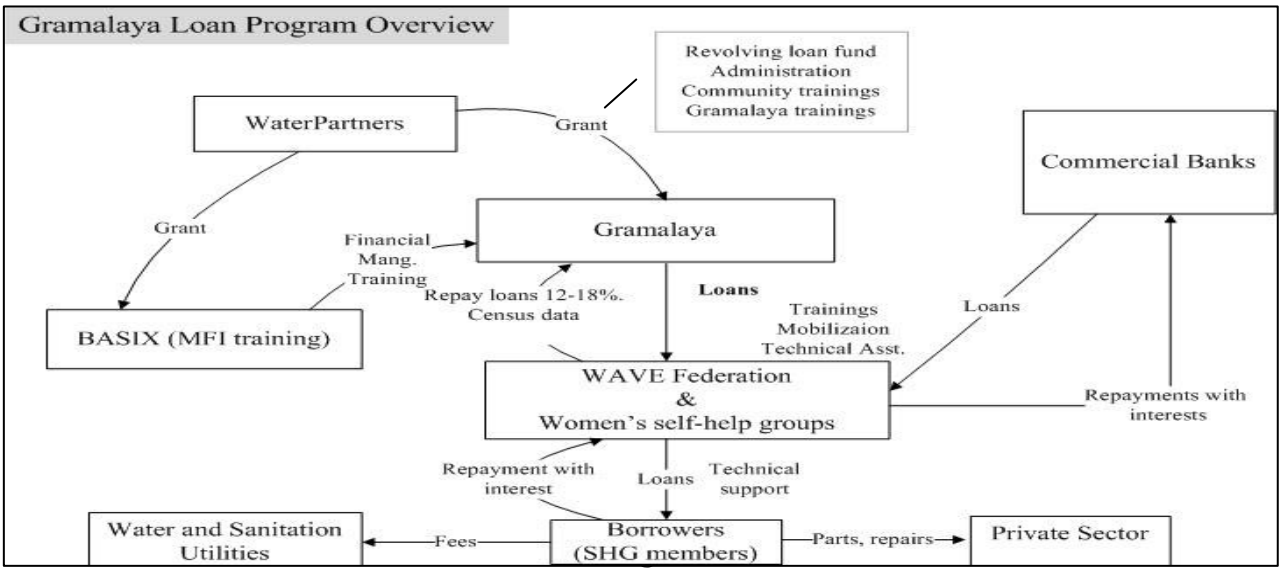
based activities. In 2006, Gramalaya received training from BASIX Bank, an India-based micro-finance institution (MFI), and restructured their program to include best practices from the micro-finance sector.

Gramalaya's loan program was executed through its Women's Action for Village Empowerment (WAVE) Federation network. The WAVE Federation is a highly organized network of approximately 2,190 women's SHGs with over 32,000 members currently active in and around the city of Trichy. Each SHG elects a representative to a village level council, which in turn elects a representative to higher level bodies to form a regional network. Gramalaya provided extensive training activities for the SHG members. These included community organizing, census data collection, community needs assessment via community mapping, water testing, health education, water supply maintenance, toilet construction techniques, management of loans, engagement of local government officials, and self-governance systems.

As part of this program, Gramalaya embarked upon "total sanitation" campaigns, which were hygiene education programs that involved every household member in the program areas. The campaigns worked alongside water and sanitation programs and were generally operated by SHG members. The SHG members educated the communities about diseases that are transferred from unprotected water and unhygienic sanitation practices. The campaigns put an enormous amount of pressure on community members to become 100 percent sanitized villages (totally free of open-defecation).

Gramalaya provided loans directly to SHGs, and SHG members distributed the loans among borrowers (see figure 1). The entire SHG was liable for repayment of the loan. SHGs generally had 10-12 members and functioned similar to the Grameen Bank model, having an elected president, treasurer, and secretary. SHG members were key program planners and community organizers that helped stir community demand for safe water and toilets. As of December 2007, Gramalaya had disbursed nearly $200,000 in loans directly, with an average loan size of $91 per borrower. Loans were for 24 months with a 12 or 18 percent interest rate and were used to construct latrines, toilets, bathing facilities, water connections, and stand posts. Before the program, loans for water and sanitation were not available in the formal market and could only be accessed at interest rates often over 120%. Gramalaya and SHG members also monitored the construction of improvements. After the construction period, the SHG members were responsible for system operation and maintenance and paying municipality fees.

Figure 1. Organizational diagram of Gramalaya's loan program.



METHODS

This paper utilizes pre- and post-program data to construct a case study of key program impacts, without any other comparison group. The study looks at program activities from 2004-2007. Data sources include census data collected pre-and post-program at program sites (N= 4,210), interviews with self-help group members and households (N=36), and program data from Gramalaya and WaterPartners. Census data was collected by trained SHG members. The census data is pulled from four villages. These villages are typical of those that Gramalaya works with and were selected based on the most complete data available. Program data was collected by Gramalaya, WaterPartners' staff during field visits, and third-party field auditors. Interviews and household questionnaires were carried out by WaterPartners staff. Two of the three authors of this paper are WaterPartners staff members who have first-hand experience with the program through site visits and/or other regular program monitoring activities.

These techniques provide a combination of quantitative and qualitative evidence that highlight the possibilities and limitations of investments in social capital and loan programs to increase access to loan capital for water and sanitation facilities.

RESULTS

Table 1 shows that since 2004, Gramalaya has disbursed nearly $200,000 directly in loans to women's SHG members. A total of 667 loans have been supplied for water improvements, and 1,496 have been executed for sanitation improvements, benefiting over 10,000 people. Census data collected by SHG members in two villages indicate that the increased investment in water and sanitation facilities has resulted in an increase in household access to safe water and sanitation facilities and a reduction in self-reported diarrheal incidence among SHG members and their families (Table 2).

Table 1. Program data.

Community	Loan start date	Interest rate (%)	Loan amount disbursed (USD)	Amount due to date (USD)	Actual realized to date (USD)	Re-payment rate (%)	Water loans	Sanitation loans
Ponnusangampatti	2004	12	12,440	14,398	7,323	51	72	67
Melakothampatti	2004	12	6,346	6,757	2,436	36	24	54
Thevarapapampatti	2004	12	7,482	7,966	4,826	61	46	90
Morupatti	2004	12	28,380	30,282	23,275	77	137	213
Ayinapatti	2005	12	5,956	6,344	3,442	54	46	71
Melakarthigaipatti	2005	12	7,815	8,325	3,888	47	32	114
Melanaduvalar	2005	12	11,741	10,686	6,894	65	88	125
Kanganipatti	2005	12	9,181	9,778	3,676	38	51	118
Tiruchirappalli	2006	18	98,438	53,765	58,358	100	171	319
Kollapatti	2006	12	4,185	2,130	2,470	100	0	108
Kothampatti	2006	12	5,357	2,933	2,786	95	0	217
Total		---	197,321	153,363	119,374	78 (Avg)	667	1,496

Table 2. Data on water and sanitation indicators from the villages of Melanaduvalar, Kangainpatti Melakarthigaipatti and Ayinapatti. Total population 4,210.

Indicator	Pre-program %	Post-program %
Water Source		
Household has a water connection in house	23	31
Household uses a public street tap	76	60
Household uses well water	1	8
Household takes less than 30 minutes to collect water	37	77
Household takes 30 to 60 minutes to collect water	56	34
Household takes more than 60 minutes to collect water	12	2
Sanitation – Primary place of defecation		
Household's toilet	9	91
Open defecation (fields, railroad tracks)	90	9
Health – number of times over six months someone in the family has suffered from diarrhea		
Zero times	14	68
Once or twice	55	15
More than twice	30	15

Over the course of its loan program, Gramalaya has realized an overall average repayment rate of 78%. While initial repayment rates under the program were quite low, under the most recent year of its loan program, Gramalaya's repayment rates have averaged nearly 100%. This significant increase in repayment rates is attributed in part to the micro-finance training Gramalaya received from BASIX to further develop their loan program management capacity. As a result of the training, Gramalaya has installed new accounting and micro-financing computer software; developed and refined their lending models, processes, terms of loans and documentation; developed borrower loan cards and applications; hired additional staff members; and developed business plans. These start-up costs, here experienced as both low initial repayment rates and capacity building activities, associated with new product development will be important to keep in mind for other organizations attempting to replicate such a program.

Interviews with SHG members about their experience with the loan program revealed nearly universal acceptance of the terms of the loans offered by Gramalaya. All respondents reported reductions in time spent to collect water and to reach a place for defecation. Respondents reported that before the program, they did not have options to access capital for water or sanitation improvements. Overall, there seemed to be good, though not perfect, understanding of the terms of the loans and a high satisfaction level with the products. There were some signs of hardship in paying back the loan. For example, some reported taking on additional night jobs, mortgaging jewelry, and selling goats to make payments. The top complaints mentioned were that the loan did not cover the entire cost of toilets, and the time from application to completion of product was too long in urban areas.

Program activities have considerably increased the pool of loan capital available to poor women and their families for water and sanitation improvements in the program region. Gramalaya found a greater demand for its loan product than it could meet through its available loan capital. In response, they facilitated over $390,000 in additional loans from commercial banks (43%), internal SHG savings (41%), and government subsidies (16%) for SHG members to install new water and sanitation improvements. This capital enabled the program to reach an additional 24,000 people and marked one of the most significant achievements of the program. Commercial loans had not been previously available to women in these communities for water and sanitation improvements. One SHG member who lives in Melandulavur reported in an interview with WaterPartners staff, "No one has approached the bank directly without a SHG for a loan because the bank is not in practice of giving those loans."

Furthermore, the program's success has drawn the attention of local financing institutions. Several commercial banks and a development bank are interested in providing significant additional capital for Gramalaya's program. Gramalaya plans to leverage its revolving loan fund as a loan guarantee to obtain the additional capital from commercial loan sources. The banks have discussed aggregated commitments as high as $2 million dollars in 2008, which would potentially serve over 60,000 people with water and sanitation improvements.

An additional major outcome of this program was Gramalaya's decision to spin off a completely new organization, Gramalaya Urban and Rural Development Initiatives and Network (GUARDIAN), which is now registered as an MFI in India. The launch of GUARDIAN is especially noteworthy, as it is one of the world's first MFIs designed specifically to provide micro-loans for water and sanitation projects. GUARDIAN will now operate and manage Gramalaya's revolving loan program.

Women in the program expressed a sense of empowerment gained from participation. Many women for the first times in their lives entered banks to obtain loans. Work with the Federation also served as a launching pad for women to pursue community development activities and procure loans for income-generating activities previously not considered acceptable for women. Some SHGs have started their own businesses, including a rock quarry and a brick production company that supplies materials needed for toilet construction.

DISCUSSION

Widespread access to formal credit markets has not typically been made available to poor women in the developing world to invest in water and sanitation improvements. However, results from this case study suggest that when tied to participatory community-groups, a viable market can be made for credit for water and sanitation improvements. Although the investments were generally not income-generating, the women in this case study chose to take out loans for water and sanitation improvements and repay those loans. This demonstrated to commercial lending institutions that a market existed for these loan products. As of this writing, funding from private loans had almost doubled the value of Gramalaya's initial revolving fund. By the end of 2008, private funding is projected to be more than ten times greater than that initial fund value. Clearly, the local credit market had failed to meet this potential. The major question that then emerges is, what did the program change that opened access to this formal credit market that was missing prior to the program?

We speculate that the investment in the development of a water and sanitation loan fund and the mobilization and organization of the SHGs opened up access to water and sanitation loans in three primary ways. First, Gramalaya created a strong demand for affordable water and sanitation improvements through their hygiene promotion activities in program communities. Second, the formation of the SHG network established the social collateral necessary to secure loans. Finally, the creation of the initial loan fund by Gramalaya demonstrated the viability of water and sanitation loan products to the private lending sector.

These three components of Gramalaya's program merit further discussion. As a water and sanitation-focused organization, Gramalaya was able to provide strong technical support and health education to complement their financing activities. While there were no pre-program data to quantify demand, Gramalaya's community-wide health and hygiene promotion campaigns appear to have been a crucial component in spurring the widespread demand for water and sanitation loan products seen under this program. It would be important in future research to explore the extent to which and in what combination these demand creation activities are necessary to unlock latent demand in communities.

The fact that the program was able to harness additional capital from commercial banks demonstrates that this program created specific elements necessary to provide the formal banking sector with the confidence they needed to enter this new market. The decentralized community-based methods Gramalaya utilizes in their water and sanitation programs complement the joint-lending group approach that has worked so well in the micro-finance sector. By sharing liability for the loan, the SHGs groups reduce the cost of vetting potential borrowers and of enforcing the loan terms for the lender. The shared liability of the groups creates an incentive for the women to form groups only with other women they know to be credit-worthy borrowers. Once the loans are taken out, group members have an incentive to use peer pressure to enforce the terms of the loan and ensure repayment. Joint-lending to SHGs reduces the information costs and risks to the bank of lending to low-income women.

Furthermore, Gramalaya, through successful execution of its own loan fund for water and sanitation improvements, has been able to show that the poor are able to repay loans not traditionally considered income-generating. Results from this case study suggest that the "pay off" from having access to an improved water and/or sanitation facility in terms of time and money saved can outweigh the cost of repaying the loan. One woman reported that her family's monthly income increased by approximately $15 because she is now able to sell some of her water and utilizes the time she used to spend collecting water every day to sell flowers.

Utilizing these insights, we now consider the extent to which this program can be replicated and scaled-up to help solve the global deficiencies in access to water and sanitation. In developing countries throughout the world there are many NGOs and MFIs that may be able to successfully replicate similar models explored in this case study. The United Nations' 2006 Human Development Report comments on the potential for scale-up of micro-finance activities for water and sanitation improvements in India, stating such programs "can be scaled up into national programs if rooted in participative community systems" (Watkins, 2006). To the extent to which this model can be replicated, it has potential to leverage the limited financial resources currently available to the sector to reach millions of people in need of safe water and sanitation.

However, we must emphasize that there will be limitations to universal replication and scaling of this model. First, we should emphasize the likely importance of the specific context in which Gramalaya was working. India has had extensive experience with micro-credit not present in all regions of the world. In discussing the potential role of micro-credit in water and sanitation projects in Sub-Saharan Africa, Mehta and Virjee note "the vast majority of MFIs in the region are still in start-up and/or consolidation phase and are grappling with capacity, outreach, and viability issues" compared to MFIs in Asia (2003, 4). Attempts at replication in such areas may be met with more modest results.

Even though the credit program mobilizes local resources it still requires extensive subsidies to create and maintain the necessary organizational structure. Efforts to make micro-credit organizations self-financing and subsidy-free have almost universally been failures and resulted in catering to higher income clients. A survey of 124 MFIs attempting to become self-financing published in the *Microbanking Bulletin* found that less than 40 percent of those were focusing on low income borrowers. Of this group, only 37 percent were successfully becoming self-financing (cited in: Armendáriz and Morduch, 2007). In the program considered in this case study, grant funding was used for mobilization of the SHGs, hygiene education, and Gramalaya's operational costs. Attempting to incorporate these costs directly into the loans will likely create overly burdensome interest rates.

Even in the presence of subsidies, credit alone will not be able to achieve universal access to water and sanitation. Revolving funds are only appropriate for those whose total income is capable of covering the cost of the water/sanitation project over all other necessities, but who have not been able to carry out the project due to a lack of liquidity or motivation of some members of the household. Appropriate solutions for some communities and individuals will simply be too expensive to be self-financed. Credit-based work for those who can afford it can free up subsidized resources for the neediest communities.

Finally, we should consider the potential for loans to promote women's empowerment. Popular discussions of micro-credit often uncritically proclaim gender targeting of loans as a source of empowerment of women. Yet appropriate gender awareness demands a more thoughtful application. For example, if women are forced to carry the burden of loan repayments by

themselves, they may have to cut back household expenditures on food and their children's education. Additionally, the gender implications of creating a public good for the household should be tied into a discussion about legal ownership of the household.

We therefore argue, it is not just the loans to women that are empowering. Numerous times representatives and members of the WAVE network referred to a sense of empowerment in making decisions that shape their households and communities. In attempting to replicate this project, it should not be thought that this result will flow automatically from gender targeting the loans. Instead, it was a result from overall gender awareness that aimed specifically at empowering women.

CONCLUSIONS

Results of this case study suggest that when tied to participatory community-groups, a viable market can be made for credit for water and sanitation improvements. Development of a water and sanitation loan fund and the mobilization of women's SHGs were able to reduce barriers to access to commercial credit and increase investment in water and sanitation facilities. To the extent that the findings of this study can be generalized to the developing world at large, they have important implications for NGOs, MFIs, the commercial sector, and policy makers who can incorporate these finance models to help accelerate access to safe water and sanitation facilities. One of the most significant conclusions derived from this program is that when capital became accessible, women chose to take out loans for safe water and sanitation improvements and were able to repay those loans. Programs such as this that correct market failures can help mobilize local resources for increased water and sanitation investment.

This being said, credit will not be a solution for all those in need of safe water and sanitation, but it can help leverage limited financial resources to reach millions of people in need of safe water and sanitation improvements. Catalyzing the start of this credit market appears to be a powerful tool for increasing access to water and sanitation and improving health outcomes.

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