

Assessing the Role of Women in Microfinance
for Water Supply and Sanitation Services

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Abstract

As microfinance institutions and development agencies consider the efficacy and scalability of microfinance in the water and sanitation field, these entities must recognize the interplay between microfinance, women, and water and sanitation services. Microfinance institutions lend primarily to women, as women are more responsible in repaying loans. Women are also intimately involved in the water and sanitation sector, as they are predominantly responsible for water related activities such as water fetching, cooking, cleaning, and similar activities. As primary stakeholders in both microfinance and water and sanitation services, the impact of microfinance projects on women must be evaluated. The success and scalability of microfinance as a funding source for water and sanitation services rests on a variety of factors including gender sensitivity, degree of community outreach and educational programming, and structure of the lending institution. In measuring the effectiveness of such programs, indicators must address the ability of microfinance projects to improve access to water and sanitation services as well as measuring whether such programs improve gender equality within a community.

Key Words: women, microfinance, water, sanitation, gender empowerment

Acronyms:

WSS	Water supply and sanitation
MDG	Millennium Development Goal
UNDP	United Nations Development Program
JMP	Joint Monitoring Programme
UN	United Nations
GLAAS	Global Analysis and Assessment of Sanitation and Drinking-Water
MFI	Microfinance Institution
NGO	Non-governmental Organization
WHO	World Health Organization
UNESCO	United Nations Educational, Scientific, and Cultural Organization
WASH	Water, Sanitation and Hygiene
GDP	Gross Domestic Product
GWA	Gender and Water Alliance

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I. Introduction

Microfinance is a relatively new source of funding in the water supply and sanitation (WSS) sector and has potential to help increase access to WSS while improving the financial power of impoverished people. Assessing microfinance in the WSS sector provides a unique opportunity to analyze the implications such projects will have on women and gender empowerment. Microfinance institutions lend primarily to women. Women also play a predominant role in water management in developing communities, as they are typically responsible for water related activities including water fetching, cooking, cleaning, and other similar activities. Using microfinance in the WSS sector provides a unique opportunity to increase access to WSS services, create female ownership of such resources, and promote gender equality. However, microfinance is an extremely complicated source of funding and projects must incorporate gender sensitivity and educational outreach in order to ensure that access to WSS sources occurs in a sustainable manner and to ensure that women are given a voice in the development of such services, and ultimately benefit from loans for WSS services. This paper sets out to give a broad overview of the three components of this thesis: microfinance, water and sanitation, and women. The paper begins with a literature review of the global water and sanitation crisis, microfinance, and improved water and sanitation sources. The results section will then discuss five case studies from microfinance institutions and NGOs working in the water and sanitation space. Following the results section is a discussion of additional factors that affect the use and success of microfinance in the WSS space, both from a development perspective and gender empowerment perspective. Finally, this

paper concludes by extracting best practices from the case studies in relation to topics addressed in the discussion section and by outlining the preconditions for the success and failure of microfinance projects for WSS.

II. Background

Global Water and Sanitation Crisis

The global water supply and sanitation (WSS) crisis is one of the looming development issues of the 21st century. The World Health Organization (WHO) defines access to water as 50-100 liters of water per person per day (United Nations Water for Life 2010). The source of water must meet the drinking-safety levels of national or local standards and must be within 1,000 meters of the home with collection time under 30 minutes (ibid.). The United Nations Development Program (UNDP) claims that water should be affordable and recommends the price of water should not exceed 3 percent of household income (ibid.). The United Nations (UN) also acknowledges that “all water facilities and services must be culturally appropriate and sensitive to gender, lifecycle, and privacy requirements” (ibid.). Access to sanitation is defined by the UN as access to facilities that separate human waste from human contact, a list of such facilities can be found in Table 1 (ibid.).

As of 2010, over 780 million people lacked access to clean water and 2.5 billion lacked access to improved sanitation, according to the 2012 Millennium Development Goal Progress Report by the WHO and United Nations Educational, Scientific, and Cultural Organization (UNESCO)’s Joint Monitoring Programme (JMP). In 2000, the

United Nations developed the Millennium Development Goals (MDGs) to reduce extreme poverty by setting targets to be met by 2015 (United Nations 2010). Target 7c of the MDGs calls for countries to “halve, by 2015, the proportion of people without access to safe drinking-water and basic sanitation” (United Nations 2010). JMP’s 2012 Progress Report announces that, as of 2010, the target for drinking water has been met, as over 2 billion people gained access to improved drinking water sources since 1990 (WHO/UNICEF JMP for Water Supply and Sanitation 2012). However, the JMP Report recognizes that there still remains a great deal of work to be done to provide the remaining 780 million people with access to safe drinking water. It is important to note that even with “access” to water, as defined above, households still may not have access to piped water in their homes and women may still have to walk a mile to fetch water.

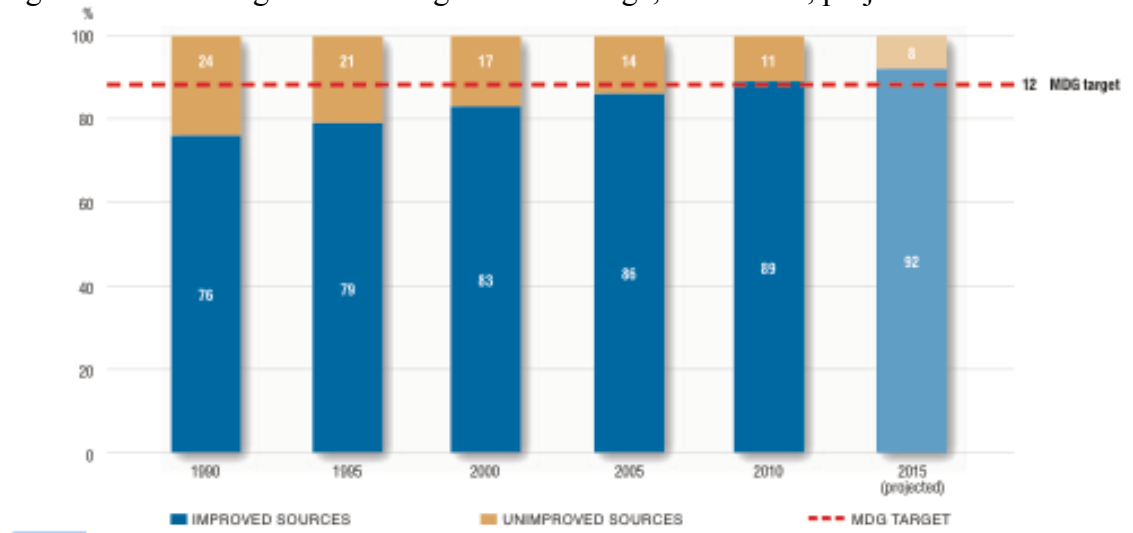
The JMP Report also recognizes that progress in the sanitation sector is moving much slower than in the drinking water sector. Consequently, the target for sanitation will most likely not be met by 2015. However, there is currently a movement to create rapid progress on this target known as the “Sustainable Sanitation: Five Year Drive to 2015” (WHO/UNICEF JMP for Water Supply and Sanitation 2012).

Development agencies continue to struggle to create scalable solutions¹ to improve access to WSS, especially among the rural poor (WaterAid America Inc. n.d.). Based on the rate of progress in 2010, the population without access to drinking water is projected to decrease from 24% in 1990 to 8% in 2015, surpassing the MDG by 4% (WHO/UNICEF JMP for Water Supply and Sanitation 2012). According to the 2012

¹ A scalable solution is one that can be used successfully in multiple locations or which can grow and expand in the area in which it exists.

JMP Report, the MDG Target 7c has already been met and will continue to surpass the MDG target for 2015 as seen in Figure 1(*ibid.*).

Figure 1: Trends in global drinking water coverage, 1990-2010, projected to 2015



Source: WHO/UNICEF JMP for Water Supply and Sanitation 2012.

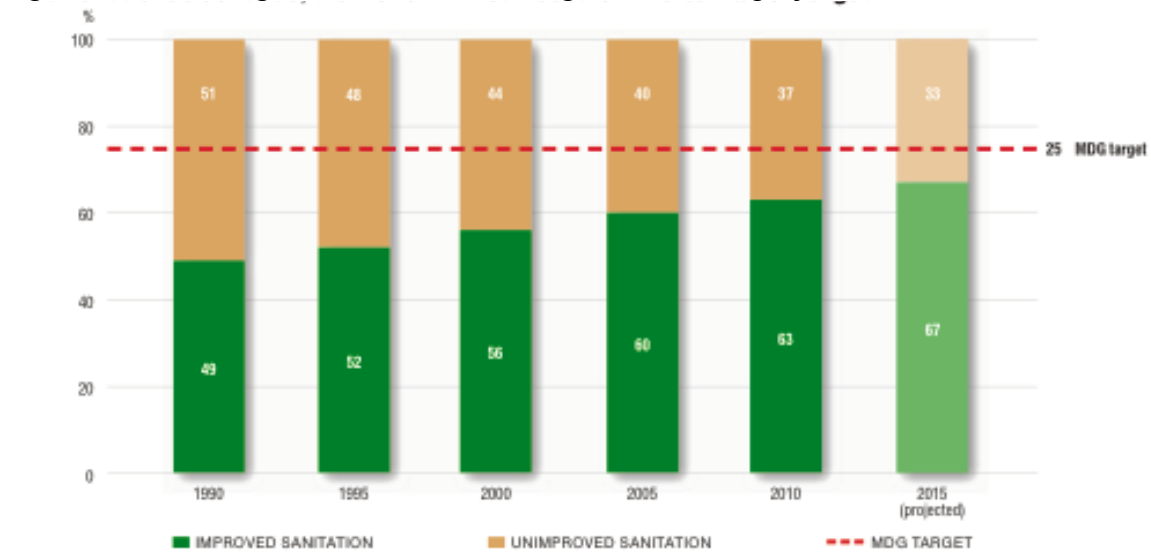
By contrast, the progress on sanitation has been much slower. The MDG aims to decrease the percentage of the global population without access to improved sanitation² from 51% to 25%. JMP estimates that by 2015, 33% of the population (over 2 billion people)³ will still be left without access to improved sanitation, missing the target by a significant amount as seen in Figure 2 (*ibid.*). Considering only the aggregated data can be deceiving. Some regions have made significant effort to improve access to water and sanitation, as seen in Eastern Asia, while others have failed to improve or remained

² See Table 1 on page 16 for full definition

³ 2 billion people calculation: based on 2010, if 2.5 out of 6.7 billion (37%) people lacked access to sanitation, and population growth continues at same rate (from 2010-2012 grows from 6.7 to 7 billion), then by 2015 if 33% of people lack access that will be ~2.4 billion people

stagnant, such as Sub-Saharan Africa and Oceania (WHO/UNICEF JMP for Water Supply and Sanitation 2012).

Figure 2: Trends in global sanitation coverage 1990-2010, projected to 2015



Source: WHO/UNICEF JMP for Water Supply and Sanitation 2012.

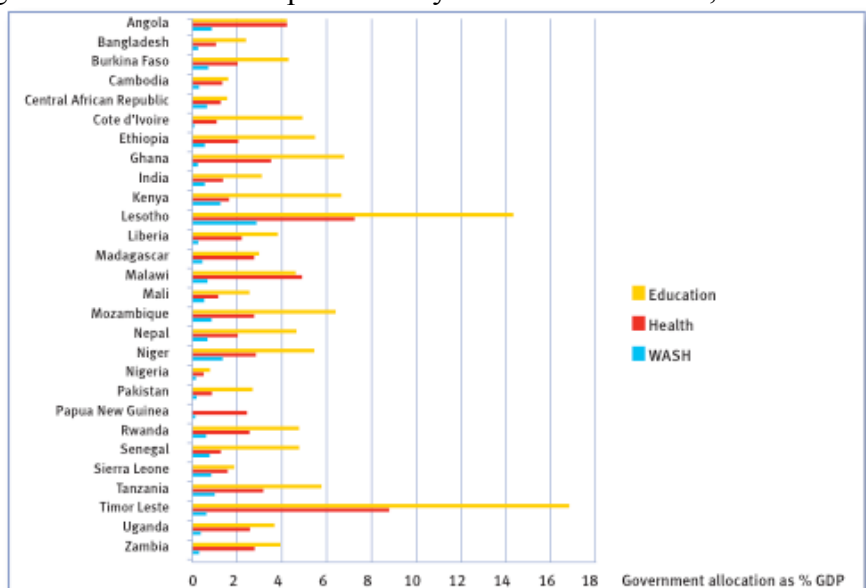
Significant funding will be needed to meet the MDG for sanitation. Lack of access to WSS has consequences that span from health degradation to hours of daily water fetching for families, all of which perpetuate the cycle of poverty. The global WASH crisis is deemed the primary cause of diarrhea, which kills over two million people each year and is one of the main causes of death for children who lack access to WSS services (WaterAid 2011). Moreover, the health consequences from drinking contaminated water and poor hygiene associated with inadequate sanitation services are substantial and beyond the scope of this paper, but account for many of the health problems found in developing countries.

Financial Flows

In order to provide sustained water and sanitation services, significant financial contributions are necessary. The WHO estimates that the total spending required each year in developing countries to meet the MDG for water and sanitation is US \$18 billion dollars. Funding needed to maintain existing services is \$54 billion dollars (WaterAid 2011). This goal may be especially hard to meet for a number of reasons. First, while global aid has been increasing, aid for WSS has declined over the past 15 years (ibid.). From 1997 to 2008, development aid for WSS decreased from 8% to 5% while aid to health increased and to education remained unchanged (United Nations Water for Life 2012).

Accordingly, the governments of many developing countries focus more of their spending on health and education than on the provision of water and sanitation services, which results in inadequate financial commitments from such domestic governments to this issue (WaterAid 2011). However, according to the UN, there is considerable payback for aid invested in WSS. Achieving the MDGs could result in US \$3 to US \$34 per US \$1 invested and additional improvements to drinking-water quality could result in a payback of US \$5 to US\$ 60 per US \$1 invested, which provides incentive to developing countries and aid organizations to invest in WSS (United Nations Water for Life 2012). Figure 3 shows a breakdown of the government expenditure on education, health, water, sanitation, and hygiene as a percentage of its GDP as of 2009. The percentage of expenditures on water, sanitation and hygiene (WASH) is significantly lower than in the education and health sectors in every single country studied (WaterAid 2011).

Figure 3: Government expenditure by sector as % of GDP, 2009



Source: WaterAid 2011.

Water and sanitation services are typically funded by the 3T's: tariffs, taxes, and transfers, defined in Figure 4:

Figure 4: Defining the 3Ts

Defining the 3Ts

“Tariffs” are funds contributed by users of WASH services for obtaining the services. Users generally make payments to service providers for getting access to the service and for using the service. When the service is self-provided (e.g. when a household builds and operates its own household latrine), the equity invested by the household (in the form of cash, material or time—“sweat equity”) would also fall under “tariffs”.

“Taxes” refer to funds originating from domestic taxes that are channelled to the sector via transfers from all levels of government, including national, regional and local. Such funds would typically be provided as subsidies, for capital investment or operations. “Hidden” forms of subsidies may include tax rebates, soft loans (i.e. at a subsidized interest rate) or subsidized services (e.g. subsidized electricity).

“Transfers” refer to funds from international donors and charitable foundations (including NGOs, decentralized cooperation or local civil society organizations) that typically come from other countries. These funds can be contributed in the form of grants, concessionary loans (i.e. loans that include a “grant” element in the form of a subsidized interest rate or a grace period) or guarantees.

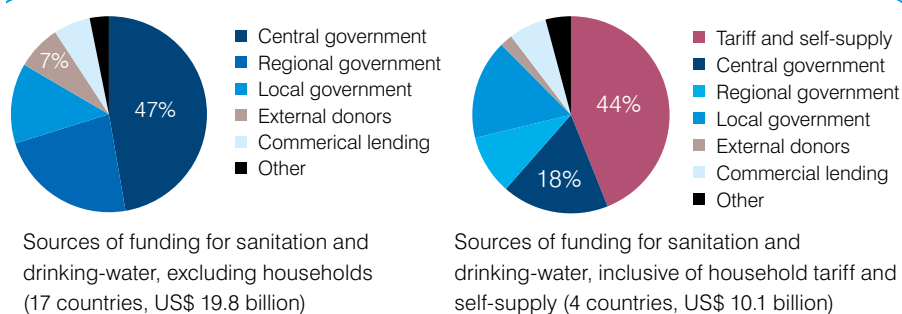
Source: UN-Water 2012.

However, it is difficult to cover all necessary investments upfront solely from tariffs, taxes, and transfers. Consequently, repayable financing sources, such as commercial or concessionary term loans⁴ are used to “bridge” the financial gap.

Figure 5 shows the results of a survey featured in the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) 2012 Report to determine the sources of funding within the WASH sector. The main sources of funding for WASH determined by this survey are tariff and self-supply, central government, regional government, local government, external donors, and commercial lending. The circle on the left shows results from 17 developing countries that were only able to provide data on transfers and taxes, not tariffs. Based on that data from these countries, it is evident that the majority of funding comes from central governments. The circle on the right shows data from the 4 countries that were able to provide data on tariffs in addition to taxes and transfers, Iran, Bangladesh, Thailand, and Lesotho. With the information provided by these respondents on tariffs, it is evident that household tariffs and self-supply are the largest sources of funding for WSS services. Therefore, tariffs and self-supply may be the largest source of funding in developing countries, however this is yet to be confirmed due to the lack of available data from most developing countries on tariffs.

⁴ Concessionary term loans “include a ‘grant’ element in the form of a subsidized interest rate or a grace period” (UN-Water 2012).

Figure 5: Sources of financing for drinking water and sanitation



UN-Water 2012.

While this data provides a breakdown of financing sources, due to the complex nature of the financial flows to the WASH sector, data is usually not able to provide an accurate amount spent on WASH services. Transfers from OECD donors are more accurately recorded but “data on domestic government spending and private spending (mostly from households via tariffs or direct investments) are either incomplete or unreliable,” making it difficult to rely on aggregate data (UN-Water 2012).

The 3Ts explain the primary flows of financing to WSS services. However, repayable financing sources are needed to fill in the gaps in financing that the 3Ts are not able to cover. The lack of complete data on the financial flows for WSS service provision creates difficulty in estimating the gap in funding that can be filled by repayable financing sources, which include microfinance.⁵ A study conducted by the Gates Foundation estimates that the potential demand for microfinance services in the WSS sector from 2008-2018 will be over USD 12 billion (Mehta 2008). Based on Figure 5, the percentage of WASH financing from tariffs and self-supply is significantly large. Therefore, there may be potential for microfinance to expand into the tariff and self-supply sector. However, this is particularly difficult to estimate because tariffs, “such as

⁵ Microfinance is explained in the next section.

those paid to informal WASH service providers or investments by households, is usually not tracked, even though isolated studies have sought to estimate such tariffs” (UN-Water 2012).

Despite the difficulty in estimating the exact proportion of funding that can be provided by microfinance in the WSS sector, there is certainly potential for microfinance to help close the funding gap created by the 3Ts.

Microfinance

Access to credit is essential to enable the poor to build wealth. Microfinance allows poor people to gain access to capital by extending financial services to those who typically lack access to credit and financial institutions. One of the most common types of services offered by microfinance institutions is the micro-credit loan. Loans provide much needed capital for people to start businesses and engage in income-generating activities. Because poor people often lack a steady source of income and lack access to collateral that banks require to secure a loan, they have particular difficulty gaining access to credit or other financial capital. When borrowers do not have assets to secure a loan, the risk to banks of issuing loans increases, and conventional banking institutions generally view such borrowers as “unbankable,” refusing to issue loans to such individuals (Weigelt 2012). Furthermore, there is often a lack of financial institutions in poor areas, particularly in poor rural areas, making access to capital even more difficult.

Micro-credit provides a potential solution to address the difficulty poor individuals in developing countries have in obtaining access to capital. Microfinance institutions (MFIs) do not require credit histories and accept non-conventional forms of

collateral, which include household or business items and community/social guarantees (Weigelt 2012). Grameen Bank is traditionally credited for initiating group based micro-credit loans, which utilize existing social bonds and networks between people in communities as collateral (sometimes referred to as “social collateral”) rather than requiring the traditional economic collateral (Arney, et al. 2008). These borrowers are typically women. Under this model, women in a particular community apply for loans from the MFIs in groups and the group guarantees each loan.

In rural areas of developing countries, the size of a loan needed to start a business is often quite small. Microfinance loans in rural areas are typically between \$10-\$300 USD and in peri-urban/urban areas can range from \$100-\$3,000 USD (Weigelt 2012). Microfinance has grown immensely since the 1980s and services are expanding to provide a wide range of different types of financial inclusion strategies for the poor.

MFIs use a variety of business models to issue loans. Most adhere to a version of the following system: a MFI or commercial bank will partner with local Non Governmental Organizations (NGOs) or traditional financial institutions to create linkages between international banks and institutions with local and traditional institutions. MFIs use the local organizations as a medium to reach local customers and provide loans in this manner. Some local institutions, including NGOs, provide loans directly to customers as well. It is important to note that interest rates for micro-credit loans are notoriously high and can largely be attributed to the high transaction costs for processing small loans. These costs can also increase when servicing rural areas due to transportation costs. In 2006, the median interest rate was 26.4%. These rates are similar

to credit cards but much lower relative to rates charged by money lenders⁶ (Weigelt 2012).

Microfinance is a relatively new tool in the WSS sector. Loans have been used to provide capital for improved access to water supply and sanitation services including: household water and sewerage connections, latrines, sinks, wells, small piped water systems, and rainwater harvesting (WaterCredit 2008). However, these types of loans are issued less frequently, as water and sanitation projects have typically not been financed by micro-credit loans because such projects are generally not viewed as income-generating activities (The Netherlands Water Partnership and IRC 2007). However, in many rural and peri-urban communities, this perception does not hold true—in some communities, water is privately owned, and members of the community must pay to access water sources. Micro-credit loans provide community members with the opportunity to build household connections or to build supplementary community water sources (e.g. via boreholes or water tanks), ultimately decreasing the amount of money spent to access water by community members.

Access to safe water supplies and sanitation has additional economic values that are often difficult to quantify. The opportunity costs of fetching water are quite large—not only does time spent fetching water prevent women from participating in other household activities including food preparation and educating children, but it also prevents them from engaging in income-generating activities. Additionally, families spend large portions of their income on healthcare to address water related diseases. Such diseases also adversely affect productivity, reducing the capacity of both men and

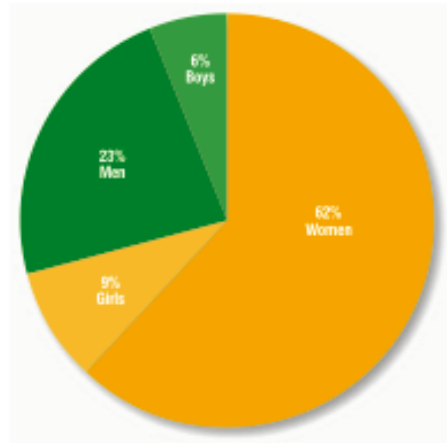
⁶ Money lenders are typically local individuals who lend small personal loans at very high interest rates (Fernando 2006).

women to work and generate income. With better access to improved sanitation and clean water sources, families spend less money on health care due to improved health and are able to spend more time participating in productive activities (Arney, et al. 2008).

Gender

Women's involvement in water management was first recognized as critical to the success of development projects in the 1970s due to women's "considerable roles, concerns and priorities in water management" (Ivens 2008). In many societies, women are primarily responsible for water collection and for activities that require water, including cooking, washing, and bathing children. As a result, women are disproportionately affected by inadequate water and sanitation facilities (Mihelcic, et al. 2009). In many countries, women walk many kilometers each day to fetch water, spending most of their time and energy on this activity. In Sub-Saharan Africa, for example, women account for 62% of the labor force involved in water collection: girls account for 9%: boys for 6%: and men for 23%, as seen in Figure 6 (WHO/UNICEF JMP for Water Supply and Sanitation 2012). Access to water is a large factor in the amount of time women have to engage in activities outside of the home. Additionally, if water sources become contaminated or dry up, women are forced to walk longer distances or pay more for water, creating additional hardships.

Figure 6: Distribution of the water collection burden among women, children under age 15 and men in households without piped water on premises, 25 countries in sub-Saharan Africa, 2006-2009 (per cent)



Source: WHO/UNICEF JMP for Water Supply and Sanitation 2012.

There are high opportunity costs associated with water collection and the health consequences from lack of access to WSS services. Collectively, women spend an estimated “73 billion hours collecting and queuing for water annually” (Water.org 2011). Time spent fetching water takes away from other productive activities such as childcare, food preparation, and income-generating activities (Mihelcic, et al. 2009). With improved access to WSS, women could spend this time participating in income-generating activities or activities outside of water collection. Additional opportunity costs result from the health degradation associated with poor drinking water quality and lack of sanitation services. Women and children are also often more vulnerable to the health consequences from consuming poor quality water (Mihelcic, et al. 2009). Gaining access to these resources improves health and consequently increases productivity, reduces school absences, and decreases healthcare expenditure (Water.org 2011).

Women are also disproportionately affected by lack of access to sanitation. Without proper sanitation facilities, women often must wait until dark to relieve themselves (United Nations 2006). This not only has health consequences but also poses serious security risks to women, as they are vulnerable to rape or attack during these trips. The effect of inadequate sanitation on menstruation hygiene is also an important issue that is often overlooked in WSS projects. Many girls miss school during their menstruation cycles and end up dropping out of school as they fall behind in their classes (Jacobs 2012). In South Africa, the Water Research Commission found that 30% of girls do not attend school during menstruation and 60% lack access to sanitary ware (Jacobs 2012). Therefore, access to sanitation does not simply result in compromised health, but it also affects women's security, ability to attend and to succeed in school, as well as economic opportunities.

Improved Water Supply and Sanitation Systems

There are a number of generally accepted criteria for defining “improved” versus “unimproved” water supply and sanitation systems seen in Table 1. Unimproved water sources include surface water, unprotected dug-wells and springs. These sources are considered unimproved because they most likely contain contaminants that are harmful to human health. Improved water sources include protected wells and springs, boreholes, standpipes, rainwater collection, and piped water.

Table 1: Improved vs. Unimproved Drinking-Water Sources and Sanitation Facilities

IMPROVED DRINKING-WATER	<p>Use of the following sources:</p> <ul style="list-style-type: none"> • Piped water into dwelling, yard or plot • Public tap or standpipe • Tubewell or borehole • Protected dug well • Protected spring • Rainwater collection
UNIMPROVED DRINKING-WATER	<p>Use of the following sources:</p> <ul style="list-style-type: none"> • Unprotected dug well • Unprotected spring • Cart with small tank or drum • Tanker truck • Surface water (river, dam, lake, pond, stream, canal, irrigation channel) • Bottled water
IMPROVED SANITATION	<p>Use of the following facilities:</p> <ul style="list-style-type: none"> • Flush or pour-flush to: <ul style="list-style-type: none"> • piped sewer system • septic tank • pit latrine • Ventilated improved pit (VIP) latrine • Pit latrine with slab • Composting toilet
UNIMPROVED SANITATION	<p>Use of the following facilities:</p> <ul style="list-style-type: none"> • Flush or pour-flush to elsewhere (that is, not to piped sewer system, septic tank or pit latrine) • Pit latrine without slab/open pit • Bucket • Hanging toilet or hanging latrine <p>Shared facilities of any type</p> <p>No facilities, bush or field</p>

Source: JMP *Types of Drinking Water Sources and Sanitation* 2010.

Unimproved sanitation systems include open pits, hanging toilets, flush systems that do not direct waste through piped systems or contain the waste in any way.

Unimproved sanitation systems can pose serious health hazards as human waste is not contained and can contaminate the water supply and food sources, which results in the

increased spread of disease (Mihelcic, et al. 2009). Many communities form water and sanitation committees and assign members of the community the responsibility of maintaining the water and/or sanitation system and collecting fees for operation and maintenance costs. However, such communities are often not able to provide funds for operation and maintenance, such as if a handpump or a borehole breaks. Consequently, the borehole goes unused and community members revert back to “unimproved” water sources.⁷

There are a number of factors required to provide improved water and sanitation systems. First, access to capital to cover the initial investment is critical in order to build the water or sanitation system. Second, there must be a source of funds that is sustainable throughout the lifecycle of the water or sanitation system that can be used for operation and maintenance costs. Additional factors include community participation in the financing and construction of improved sources and the necessity for building skills within the community to ensure systems can be fixed if they malfunction.

III. Scope of Research

This paper sets out to describe the potential for microfinance to be used in the provision of water supply and sanitation services. The scope of this project covers microfinance for poor rural and peri-urban areas. Five case studies were chosen to demonstrate scenarios in which microfinance has been used successfully in order to assess best practices. The criteria for choosing the case studies were based on the amount

⁷ This statement is based off of the East Gonja District WASHCost Community Reports analyzed by the author in 2009 during her work with the WASHCost Project in Kumasi, Ghana.

of available information on project implementation and evaluation. The case studies are not representative of the entire market for microfinance for water and sanitation services.

In order to evaluate the potential scalability of microfinance in the water and sanitation sector, this paper provides a comprehensive overview of the potential global microfinance market and the global demand for water and sanitation services. This data is evaluated against the case studies in order to provide recommendations to future microfinance projects in the water and sanitation sectors.

The data used in this paper is based on secondary sources including reports from the World Health Organization (WHO) and United Nations Educational, Scientific, and Cultural Organization's (UNESCO) Joint Monitoring Program (JMP), UN, MFIs, and NGOs. Additional data was gathered in interviews, meetings, and email correspondence with local and global NGOs and MFIs.

IV. Results

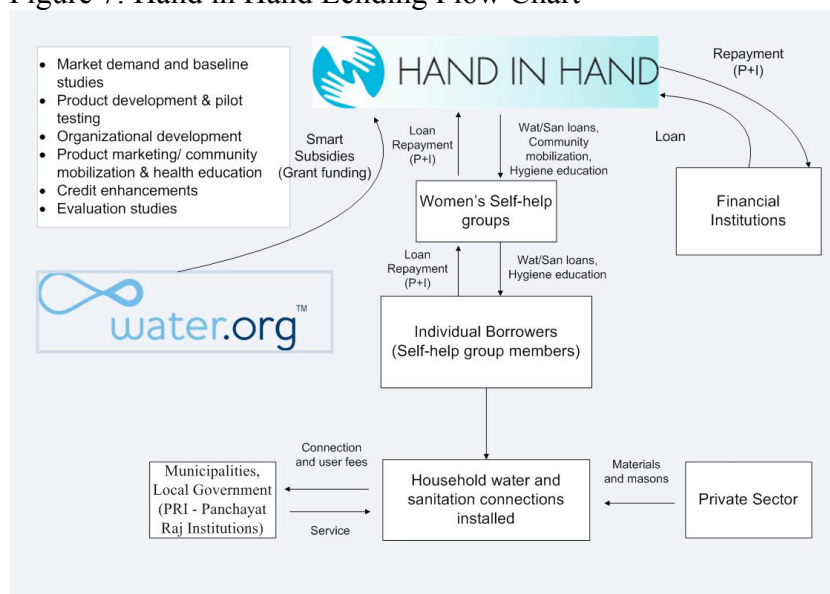
The following results were obtained from five case studies regarding specific microfinance projects that provide loans for water and sanitation systems. The case studies presented in this section demonstrate the variety of lending schemes and outcomes of microfinance projects that will later be used to prescribe recommendations for future MFI projects in WSS. The second portion of this section analyzes the potential demand form micro-credit loans for WSS through two additional case studies.

Case Studies

I. WaterCredit:

WaterCredit is an initiative of Water.org, a nonprofit organization that connects microfinance and access to credit for projects that provide access to clean water and improved sanitation services. WaterCredit provides financial capital to local MFIs so that they can provide micro-credit loans for water and sanitation projects at the individual and household level. By creating partnerships with local MFIs, WaterCredit ensures that local MFIs take advantage of their personal ties to communities, established reputations, and understanding of the local culture to create a customer base and issue loans that are tailored to the specific need of each community, as see in Figure 7. In addition to providing financial capital to local MFIs, WaterCredit provides water, sanitation and hygiene technical assistance and capacity building efforts in communities that receive loans, which helps ensure the sustainability of the project and the community's ability to repay the loan.

Figure 7: Hand in Hand Lending Flow Chart



Source: Water.org *Hand in Hand Lending Flow Chart* 2010.

Currently, loans offered by WaterCredit and its local affiliates are designated for household water and sewerage connections, toilets, sinks, tube wells, and rainwater harvest equipment (Water.org 2011). Through outreach to partner organizations, WaterCredit provides loans to twenty-one organizations in India, Bangladesh, Kenya, and Uganda. The average size of a loan is \$120. Over 90% of the WaterCredit clients are women. WaterCredit has made 51,300 loans benefitting 316,000 people with an average global loan repayment rate of 97% (ibid.). The global loan repayment rate reflects the rate at which loans are repaid by borrowers. This rate is most critical in securing funding to assure lenders and donors that repayment rates are high.

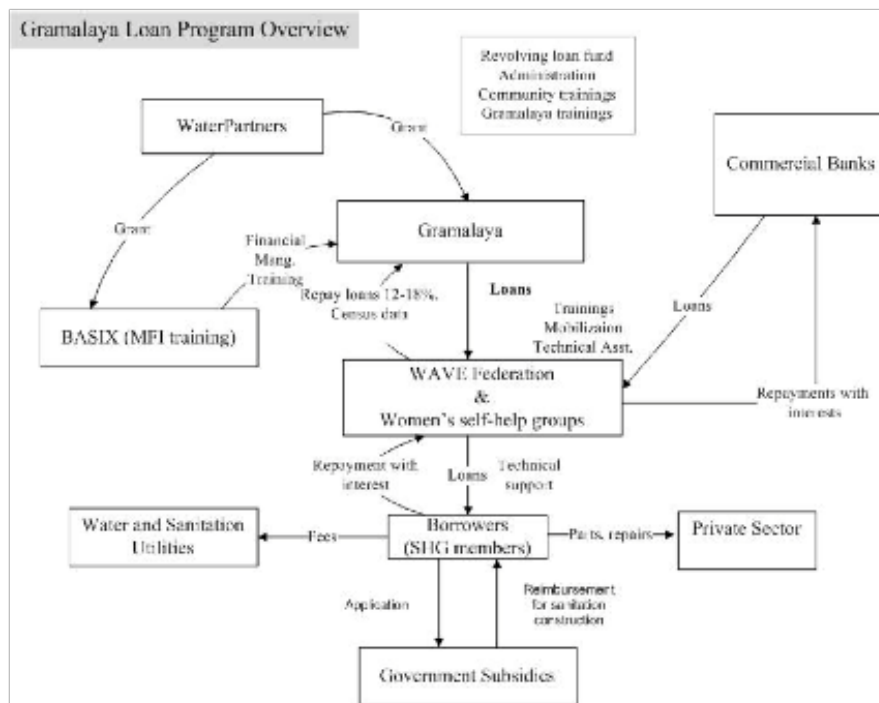
While microfinance lenders and MFI funders, such as WaterCredit, use the average loan repayment rate to measure the success of projects, it is debatable whether this measurement is indicative of the effectiveness of either the project or of the effectiveness of the loan. Many microfinance organizations only publish the repayment rates of loans as indicators of success for projects. However, studies have shown that borrowers may go into debt in order to re-pay loans to MFIs, which defeats the purpose of issuing loans to the poor, since “the objective of a microfinance project is to improve the quality of life of the recipient” (Mihelcic, et al. 2009). Therefore, while WaterCredit is reaching a large number of people, and their loans have a high repayment rate, additional indicators are necessary in order to determine the true impact of projects on both water and sanitation and on the net-wealth of the borrower (which will decrease if the borrower goes into debt re-paying loans).

II. Tamil Nadu, India:

Gramalaya is a NGO based in Tamil Nadu, India whose goal is to empower communities through the provision of water, sanitation and hygiene services. The organization was founded in 1987 and began providing micro-credit loans for water and sanitation improvements in 2004. Gramalaya distributes loans through its Women's Action for Village Empowerment (WAVE) Federation Network, as seen in Figure 8. WAVE Federation is active in the city of Tiruchirappalli (Trichy) in Tamil Nadu and consists of 2,190 women's self help groups (SHGs). Following the Grameen Bank model⁸, each SHG typically has 10-12 members with one elected President, Treasurer, and Secretary. SHGs are formed voluntarily at the village or community level and act as community organizers and educators in creating demand for improved water supply and sanitation, a role which is necessary to the success of the project. The WAVE Federation requires all SHGs to elect a representative to sit on a village level Council, which in turn elects a representative for the Regional Network Council. Upon approval from Gramalaya, the SHG is responsible for distributing the loans among the borrowers and the entire SHG is responsible for paying back the loan. The average size of the initial loans was \$91 per borrower for 24-month periods with a 12% interest rate (Arney, et al. 2008). However, after receiving advice from BASIX Bank, an Indian Microfinance Institution, Gramalaya restructured its lending program and increased the interest rate to 18% to cover administrative expenses.

⁸ The Grameen Bank model is a group lending model in which loans are granted to groups (most often comprised of women) and the entire group is responsible for guaranteeing the loan

Figure 8: Organizational diagram of Gramalaya's loan program



Source: Arney, et al. 2008.

In addition to providing loans, Gramalaya offers capacity building programs to its borrowers, which include training for SHG members in community organizing, census data collection, community needs assessment, water testing, health education, water supply maintenance, toilet construction techniques, management of loans, engagement of local government officials, and self-governance (Arney, et al. 2008). Thus, not only are borrowers and local communities obtaining access to capital, but they are also gaining the skills and training necessary to use the loans productively and to participate actively in the construction and upkeep of the improved water and sanitation sources. The Gramalaya program, however, requires extensive subsidies to sustain its programs and uses grants to fund educational projects and subsidize administrative costs (Arney, et al. 2008).

Prior to the initiation of Gramalaya's loan program, loans were unavailable on the formal market and could only be obtained through private money lenders at exorbitantly high interest rates that were often over 120%. According to a study conducted by WaterPartners (now known as Water.org)—one of the primary investors in Gramalaya's loan program—out of the 11 cities in the loan program, the average repayment rate was 78% but the repayment rates ranged from 36%-100%, as seen in Table 2 (Arney, et al. 2008).

Table 2: Gramalaya 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
Thevarapampatti	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
Melakarthisaipatti	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

Source: Arney, et al. 2008.

Instead of simply measuring and reporting the average loan repayment rates, WaterPartners looks at additional indicators of success, which include improved water source supplies, improved sanitation practices, and improved health outcomes as indicated by the number of incidents of diarrhea, as seen in Table 3. In the four villages

reported, households with water connections increased by 8% from 23% to 31%. Households using public street taps decreased by 16% from 76% to 60%. Households using well water increased by 7% from 1% to 8%. Therefore, based on these three indicators—number of water connections, public street tap use, and well water use—it appears that access to improved water sources has increased. Households also reported a decrease in time necessary to collect water. Most notably, prior to the Gramalaya loan program, 12% of households spent over 60 minutes collecting water. After the adoption of the loan program, this percentage dropped to 2%. Households spending 30-60 minute collecting water also decreased from 56% to 34%. Not surprisingly, households spending less than 30 minutes collecting water increased greatly from 37% to 77%. Accordingly, most households that previously spent 30 to 60 or more minutes collecting water were now spending less than 30 minutes collecting water. These indicators strongly suggest that there has been an improvement in the accessibility of improved water sources.

Table 3: Gramalaya data on water and sanitation indicators from the villages of Melanaduvalar, Kangainpatti, Melakarthisgaipatti 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

Source: Arney, et al. 2008.

The results from the sanitation indicators demonstrate notable improvement in levels of sanitation. The number of households with toilets increased from 9% to 91%. Additionally, the number of individuals practicing open defecation decreased from 90% practicing open defecation before the loan program to 9% practicing open defecation post-program. While these indicators suggest that the improvement in sanitation practices is from access to proper facilities, it would be interesting to determine how much of these improved practices are from improved access as opposed to increased education on proper sanitation practices.

Furthermore, the health of the community improved significantly, as indicated by the decrease in the number of times someone in the family suffered from diarrhea. The number of reported incidents of diarrhea in families over a six month period of time decreased greatly after the program was initiated, with the majority of families experiencing diarrhea once or more pre-program, to the majority of families reporting zero incidents of diarrhea over a six month period post-program.

While the indicators discussed above suggest that the loan program correlates with a significant improvement in water source, sanitation, and health for communities that had loans for water and sanitation projects, the data on loan repayment rates for the initial loans (before Gramalaya restructured its program based on the BASIX training and input) tells a different story and may suggest a different degree of success for these projects, especially from the point of view of the lender. The average repayment rate for loans that were made prior to BASIX Bank's involvement was 51 percent, which is quite low compared to average repayment rates in the seventies, eighties, and nineties that is often seen in microfinance (Fernando 2006, Weigelt 2012). Once Gramalaya received

assistance and training from BASIX bank and after it raised the interest rate from 12% to 18%, the repayment rates increased to 95-100%. Therefore, low repayment rates in the four villages in the study may not have been due to the inability of borrowers to repay the loan, but could be attributed to other factors that were mitigated by restructuring the loan program. BASIX Bank has a reputation for being firm handed in maintaining high repayment rates (Weigelt 2012). Repayment rates may have risen from improvements implemented by BASIX Bank on documenting and tracking borrowers to maintain better records of loans and loan payments (ibid.).

This case study demonstrates the conflicting conclusions that can be reached by relying on different indicators. While the low repayment rates may imply that the microfinance project was unsuccessful from purely a financial point of view, a review of social indicators tells a different story and demonstrates that the project improved access to water and sanitation of the borrowers and the community as a whole.

Based on the contradictory nature of these results, it is difficult to fully determine the success of the project and it is therefore worth examining other factors concerning the project. Interviews with women borrowers indicated that repaying the loans was often difficult and they either had to ask for money from their husbands to repay the loans or sell goats, jewelry, and other possessions. Therefore, the project was not successful at improving (or maintaining) the net-worth of the borrower, as borrowers were forced to go into debt or sacrifice assets in order to pay back the loans.

From a gender empowerment standpoint, the project did not improve the bargaining power of women or empower them financially, as the women indicated they had to turn to their husbands or go into further debt to repay the loans. However, the

social indicators show a significant increase in access to clean water and improved sanitation. Thus, we may be able to conclude that the project helped improve the standard of living for women and their families as a result of decreased time spent collecting water, as well as improved health and sanitation practices.

It is hopeful to see that after BASIX Bank helped Gramalaya restructure its loan program, the repayment rates increased. Due to the high operating costs of MFIs, the internal structure and efficiency of MFIs is critical to the success of loan programs. Therefore, we may be able to attribute the inability of borrowers to repay the loans to the poor structure of the program during their participation. Additional factors that could have contributed to low repayment rates include program outreach and education for borrowers. Communication with borrowers is an extraordinarily important factor in enhancing loan repayment rates, especially for water and sanitation projects (Bavuma 2012). If borrowers do not understand how to save money to repay the loans, either from selling water, setting aside money that would have been used for healthcare expenses, or participating in income generating activities during time freed from easier access to water and sanitation, they will be forced to default or go into debt repaying loans. However, additional research is needed to determine if repayment rates were low due to Gramalaya's internal structure as a MFI, insufficient program outreach and education for borrowers, or other extraneous factors that could affect the borrower's ability to repay loans.

III. Lomé, Togo:

A microfinance initiative in Lomé, Togo demonstrates the business case for water supply projects. Loans in Lomé were issued to families to construct household water

points. The loans for these projects, averaging \$3,000 for boreholes and \$1,000 for rainwater harvesting tanks, were much larger loans than for those discussed in case studies above, which averaged around \$100. The MFIs in Lomé developed a financial mechanism to hold households and communities accountable for the loans in which two existing account holders of the MFI had to guarantee the application for the loan. Additionally, borrowers had to prove their need for improved water supply systems and demonstrate willingness to pay for water. Upon approval, the MFI pays a local entrepreneur in installments to construct the borehole. Households then directly pay back the MFI with a 21% interest rate and 2% administrative fee (Netherlands Water Partnership 2007).

This system has proven quite effective, as households are able to sell water from the water sources to pay back the loans charging 1USD/m³ for water or 0.20USD/10litre bucket of water. The study sites that 70% of the loans were repaid within 6 months (Netherlands Water Partnership 2007).

The success of this loan scheme may largely be attributed to the way in which loans were issued to borrowers. By ensuring that borrowers were willing to pay for water services, the MFI received confirmation that its loans would be used to provide a business service. When loans are issued for water service provision in areas where users are accustomed to receiving the service for free, as exemplified in the case study below, not only are the default rates likely to be high but the project is also likely to be less valued by the community or user.

IV. Wogodogo, Burkina Faso:

When initiating a loan program for improved sanitation in Wogodogo, Burkina Faso, the LAGEMYAM women's association ran into some initial hurdles. The program provided credit for excreta and wastewater infrastructure including VIP latrines, drainage and soak pits for domestic waste treatment. In recognition of the extreme poverty of the region, LAGEMYAM allowed borrowers easy access to loans, as they required only identification of the borrower for collateral. Following a revolving loan scheme, repaid loans were used to finance new loans for community members. LAGEMYAM expected that the loans would be repaid from the revenue generated by solid waste collection. However, community members were accustomed to receiving this service for free. Consequently, the revenue that was collected was not used to pay back the loans due to other more immediate needs such as food and water. The repayment rate from this initial trial was only 17.8% (Netherlands Water Partnership 2007). Over time, the NGO began involving community members in the project, giving them a sense of commitment and self-confidence. Borrowers were also educated on the importance of repaying loans for the sustainability of the revolving loan service, making borrowers more inclined to re-pay loans. As a result of these efforts, the loan repayment rate rose to 80% (ibid.).

This case study exemplifies the complications that can occur with microfinance loans for WSS services if the willingness to pay is low and/or the community does not participate in the service provision. Involving the community during the project planning and implementation phases will cultivate community value for improved WSS sources by adapting the project to meet the expressed needs of the community. When providing loans to the very poor, lending institutions must also provide educational outreach to ensure that borrowers understand how to repay loans and to ensure that there is sufficient

demand for loans for WSS services. Borrowers must understand the long-term benefits (both financially and socially) from access to WSS services in order to incentivize them to repay the loans. Otherwise, borrowers may misuse the loans, as seen in this case study, for more immediate needs, as is often feared by MFIs when lending to the extreme poor.

In this case study, repayment rates increased greatly once community members realized that the loan service would end if members continued defaulting on loan payments. Additional research is needed to determine exactly what caused the repayment rates to rise, which could result from a host of possibilities: increased outreach by the women's association to borrowers, increased participation by women in project planning and implementation, fear of losing the loan scheme, increased abilities of borrowers to save, etc. However, it may be possible that by threatening to take away the loan scheme, community members recognized the value of the latrines, stimulating demand for loans and consequently influencing borrowers to be more responsible in making loan repayments.

V. Mukono District, Uganda:

The Katosi Women Development Trust (KWDT) is a NGO based in Uganda that works to improve the living conditions of the rural poor in the Mukono District. KWDT currently works with 16 women's groups providing a revolving fund scheme for access to improved water sources (Bavuma 2012). Women can create groups within their communities and then apply for membership with KWDT. This ensures that loan services are demand driven by community members. Once the group is accepted to

KWDT, they go through the first round of training that educates the group on the financial gains from access to improved water and sanitation sources. This first step is necessary for women to understand that microfinance can be used for water and sanitation projects, not just for business development (Bavuma 2012). Once women are educated on the health effects of poor water and sanitation and on the amount of money they spend treating family members for their resulting poor health, KWDT reports that women begin to connect incidents of poor health with poor water quality and lack of sanitation facilities. Women also learn that these incidents translate into great financial burdens and could be eased by improved access to WSS.

KWDT also educates women on their potential to participate in income generating activities once they gain access to improved WSS services. In the communities in which KWDT works, women spend about four hours collecting 20 litres of water and walk up to four kilometers to do so (Bavuma 2012). Fetching water, cooking, and caring for children can consume a woman's entire day. KWDT explains to women's groups that with a household water tank, the time invested each day in water fetching will be freed for other income generating activities. One of the unique components of KWDT projects is that they go beyond the basic task of educating women on the opportunity cost of water fetching. Additionally, KWDT provides assistance and training for women to engage in income generating activities. Women have been able to purchase livestock, which they were previously unable to do because livestock require water (Bavuma 2012). Some women are also able to sell water to those who do not have water tanks when there is excess water captured during the rainy season. Training

women how to use the time freed from water fetching for income generating activities is key in these types of projects, especially for maintaining high loan repayment rates.

In order to ensure the success of loan projects, KWDT trains women's groups, upon acceptance, on how to work in groups, conduct meetings, collect money, etc. Issues of tension among women regarding the loan guarantee mechanism are typically avoided due to the demand driven aspect of project development. Once groups have formed independently and gone through the application process with KWDT, they have already proven their initial capability to work together as a group. The group trainings solidify and build upon the group dynamics, which has proven extraordinarily effective in maintaining productive group relationships.

KWDT provides a revolving fund to each women's group. The group collectively decides which individual member will get the first loan. KWDT trains specific members of the group on masonry. Then, the woman who has received the loan employs this mason to help her build the tank. The loan is not provided in cash but is instead provided through the purchasing of the materials needed to construct the tank. The treasurer of the group signs off when the materials have been received. After the tank is constructed, both KWDT and the women know the cost of the tank. An interest rate equal to the inflation rate is set and the women are then responsible for paying back the loan (Bavuma 2012). While only the woman who has received the loan for her household water tank is responsible for making loan payments, other group members may assist her if she is unable to pay on time. This guarantees that the loan is repaid to KWDT and also guarantees that once the loan is paid off, the money will be transferred to another woman

in the group so that she can construct her own water tank. While this process is slow, it has been highly successful in Uganda.

KWDT is able to offer loans with very low interest rates. The interest rates are set only to cover the inflation that accrues over the loan repayment period. It is important to understand that microfinance institutions are typically not able to provide loans at such a low interest rate and this perhaps contributes to KWDT's success. As a non-profit organization, KWDT is not entering the micro-credit space as a business venture. Microfinance institutions have additional costs that they need to cover and these are often recovered through higher interest rates. In contrast, KWDT projects are managed at a local level and they receive grants to cover some of their administrative costs.

KWDT is certainly a model for success in Uganda. There are a number of important highlights from this case study that contribute to the success of the KWDT model. First, loans are demand-driven as customers must come to KWDT to request a loan, illustrating the need for improved water or sanitation sources. Second, KWDT makes sure that women are educated on the financial and health benefits from access to improved water sources. Through this training, KWDT ensures women have the resources, skills, and knowledge to repay loans. Third, the application process for a loan requires collaboration among the group of women applying, securing group relationships before loan money is issued.

Demand for Micro-Credit for Water and Sanitation

While the case studies above address current loan programs, there are many MFIs that are considering entering the WSS sector. The demand is twofold: first, some MFIs

are considering expanding their portfolios to offer loans for social impact measures; second, NGOs and organizations that work in WSS are connecting with MFIs to use microcredit as a funding mechanism for WSS—as seen by Water.org and Water for People. Additionally, institutional investors are expanding investments in impact investing, which is considered the “double bottom line” for institutional investors. Impact investing “aims to generate positive social or environmental benefits in addition to financial returns in a risk/return environment”(Butler 2012). Firms looking to enter or expand their impact investing portfolio will be interested in investing in microfinance projects that create social/environmental benefits on top of financial return—which microfinance in the WSS has potential to provide. The first case study below exemplifies both the creation of partnerships between WSS organizations and MFIs and the demand for micro-credit loans for WSS in communities. The second case study looks at global demand for micro-credit loans for WSS and is based on a study conducted by the Gates Foundation in 2008.

I. Kolkata, India

Arohan is a for-profit Non-Bank Financial Company that provides microfinance services based in Kolkata, India. In conjunction with Water for People, Arohan conducted a study in 5 branches, surveying 595 clients, to determine the potential demand for water and sanitation services through microfinance loans (Arohan Financial Services Private Limited 2012). On average, 60% of respondents were considering private water connections in the future, as most of the households surveyed had access to drinking water from improved sources (however, water for other household activities was

predominantly collected from unimproved water sources). Arohan also considered demand for water purifiers and found that 48% of clients were interested in loans for water purifiers. Access to sanitation was in much higher demand—58% of clients did not have access to a private or public toilet. Consequently, 81% of clients were considering toilet construction in the future and 79% of clients expressed interest in a loan for toilet construction (Arohan Financial Services Private Limited 2012).

Water for People continues to work with Arohan to help assess the demand for water and sanitation services. Based on this study, Water for People sees great potential for the extension of loans for WSS services in these regions.

II. Global Demand for WSS

On a macro level, the Gates Foundation sponsored a study in 2008 to determine the potential demand for microfinance in the water and sanitation space. In an assessment of current MFI portfolios, the study found that water supply and sanitation comprised less than 1.8% of total MFI portfolios (Mehta 2008). While water supply and sanitation are not the most popular types of microfinance loans, they are underrepresented by this figure because most of these loans are quite small and therefore account for a small portion of MFI portfolios. Accordingly, 30% of borrowers from Grameen Bank and 10% of borrowers from the Vietnam Bank for Social Policy (VBSP) borrow for water supply and sanitation (ibid.). Therefore, customers of these large MFIs have demonstrated demand for micro-credit for water and sanitation services. Based on 38 countries used in the study, Mehta estimates that the total demand for microfinance from 2004-2015 for water supply and sanitation services will be USD 12 billion with 125

million borrowers. The majority of demand for microfinance services (72%) is for sanitation, largely because access to sanitation lags far behind access to water. The breakdown of loans and borrowers for East/Southeast Asia, South Asia, and Sub-Saharan Africa for urban/rural water and sanitation can be seen in Table 4.

Table 4: Potential Demand for Microfinance across WSS Segments and Regions (2004-2015)

	Borrowers (in millions)			Total Estimated Loans (in USD billions)		
	East/Southeast Asia	South Asia	Sub-Saharan Africa	East/Southeast Asia	South Asia	Sub-Saharan Africa
Urban Water	7.5	7.9	4.7	0.6	0.9	0.4
Rural Water	5.0	10.3	3.1	0.2	1.1	0.2
Urban Sanitation	23.2	7.9	3.4	1.7	1.4	0.6
Rural Sanitation	17.3	30.8	4.4	1.1	3.1	0.8
Total	53.0	57.0	15.6	3.7	6.6	2.0

Note: Refer to text for details. Figures have been rounded and totals may not be exact.

Source: Mehta 2008.

The study sites a number of issues in scaling up microfinance for water supply and sanitation. These include an inadequate understanding among potential financiers and stakeholders of the potential market demand and local policies for loans and a general lack of awareness of water supply and sanitation issues among MFIs. And conversely, there is a general lack of awareness among water supply and sanitation practitioners of the potential for microfinance in this sector. Additionally, it is difficult for MFIs to access medium/long-term funds and combine them with subsidies in order to afford the provision of water and sanitation loans (Mehta 2008).

This study also outlines the potential for microfinance in the water and sanitation sectors based on geographic locations, population disparities (i.e. urban vs. rural), degree of improved services required, etc. The potential for MFI entrance in many regions depends on government regulations (or lack thereof), willingness of banks to participate

in microfinance, history and ability of communities to repay loans, etc. Detailed information on these criteria can be found in the Gates Foundation study (Mehta 2008).

V. Limitations

The conclusions drawn in this paper are limited by the data collected and scope of the paper. Due to the difficulties in contacting some of the case study organizations and the inability of the author to interview the borrowers themselves, analyses of the data collected are based solely on the information collected through literature-based research. Therefore, the author recommends additional research, where necessary, to determine specific conclusions from each case study. For example, the Gramalaya case study is based solely on information gathered from studies and NGO reports, limiting the amount of information available to make conclusions regarding the increase in repayment rates experienced. Conversely, the KWDT case study is based on the author's interview with a Project Manager from KWDT at the 6th World Water Forum. Determining the exact repayment rates and obtaining quantitative data was limited because of the lack of available written reports on the case study.

Limitations also arise from the accuracy of the data collected. It is difficult to estimate the exact opportunity costs from the lack of access to water and sanitation. Translating time saved from water collection into income generation will most likely change from community to community and woman to woman. Additionally, relying on family self-reporting to indicate health incidents related to water-borne illnesses and tracking the change in this number based on personal accounts may be unreliable or inaccurate. Measuring gender empowerment is exceptionally challenging as well.

Gender empowerment is sometimes measured in changes in domestic violence, bargaining power of women, equity in resource control, and other factors—which are all difficult to measure quantitatively and are subject to biases. Therefore, obtaining social indicators, while necessary to determine the social implications of microfinance and WSS projects, is difficult and can be easily misconstrued. MFIs may also have little incentive to invest in collecting such data, as data collection may increase the costs to the MFI.

Additional limitations exist in the analysis of microfinance as a scalable funding mechanism. Government policies in some countries prevent microfinance institutions from growing or expanding their services (Jhabvala 2012). For example, the Indian government restricts MFIs from offering savings programs. This issue is not explored extensively in this paper due to limitations in analyzing each country specifically for policies affecting MFIs. However, it should be understood that this is a limiting factor in assessing the potential of microfinance for water and sanitation services.

Finally, this paper avoids making specific recommendations regarding the exact structure of MFIs and WSS projects. The design and execution of both microfinance and WSS projects must be tailored to the cultural and social norms of each community and must take into account regional policies that may affect the structure and abilities of the MFI.

VI. Discussion

Based on the case studies and demonstrated demand for micro-credit for WSS, there are a number of questions that must be raised regarding the appropriateness of microfinance in the water and sanitation sector, the goals of these projects (profit,

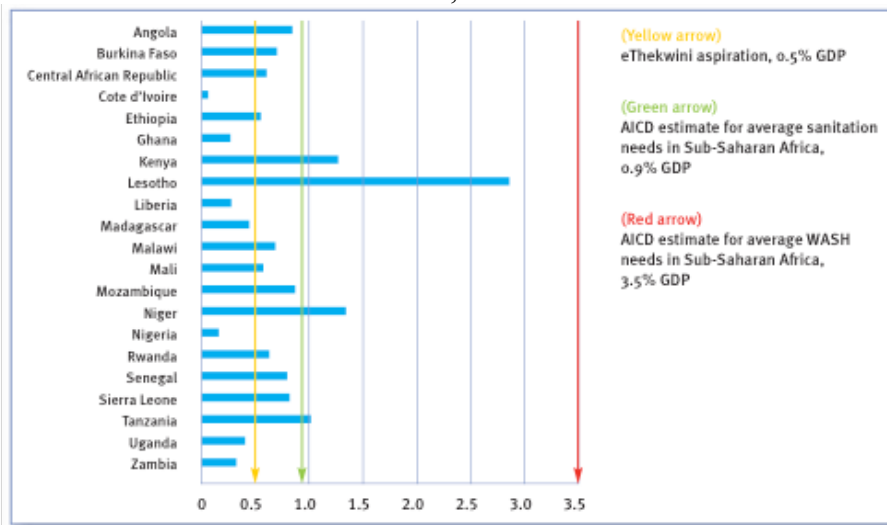
improved access, empowerment of women), and the criteria used to measure the success and sustainability of such projects.

The first question raised among development workers is whether microfinance is an appropriate funding mechanism for WSS services that are typically public goods provided by the government. Mehta (2008) argues that microfinance can be a tool for relieving public resources that would otherwise provide WSS services so that these resources can be used for other public services. Microfinance projects for water and sanitation are mostly community led, allowing community groups to access microfinance funding rather than waiting for government subsidies (Mehta 2008). Not only is this process much faster than waiting for government funding, but it also frees public expenditure for other areas such as healthcare, education, and extending public municipality services to the peri-urban and rural poor.

However, there are a number of disadvantages in using microfinance in this sector. It is typically the responsibility of governments to provide public water sources to its constituents. If microfinance projects are able to achieve access to water and sanitation sources with minimal government funding, governments may no longer be held accountable or regard themselves as responsible for providing these services. While microfinance certainly seems like a more immediate means of improving access to water and sanitation sources, especially in rural areas, it may not be the most sustainable way and may have other less positive ramifications. Global discourse has indicated that governments should not be relieved from their obligation to extend clean water to all citizens. In 2010, the United Nations declared water and sanitation a human right (United Nations General Assembly 2010). The UN Human Rights Council subsequently passed a

resolution in 2011 recognizing the human right to water and sanitation and reaffirming that “States have the primary responsibility to ensure the full realization of all human rights, and must take steps...to the maximum of its available resources, to achieve progressively the full realization of the right to safe drinking water and sanitation by all appropriate means” (Human Rights Council 2011). By regarding water and sanitation as a human right, governments are now held responsible for playing a significant role in the provision of such services. Based on Figure 3 (page 11), governments will need to increase expenditure on the provision of water and sanitation services to meet the MDGs by 2015. A study conducted by WaterAid reports that on average, countries in Sub-Saharan Africa will need to spend 3.5% of GDP each year to achieve the MDGs for water and sanitation (WaterAid 2011). The red marker in Figure 9 marks the jump to 3.5% in GDP expenditure needed by African countries to meet these goals for water and sanitation.

Figure 9: Government WASH expenditure in African countries as % of GDP compared with commitments and benchmarks, 2009



Source (both): national government documents

Source: WaterAid 2011.

The sensitive nature of making water and sanitation a human right has been a growing topic of discussion in the women and water community. At the Women's Preconference to the World Water Forum in March 2012, professionals in the women and water field developed key demands for the Rio +20 Conference in June 2012 to include women in the decision-making process for water and sanitation projects. Conference attendees acknowledged the slow integration of gender sensitivity in water and sanitation projects (Waldorf 2012). They indicated that women are often excluded from key decision-making processes in the planning and implementation of many development projects, harming both women and the effectiveness of the projects themselves, as women are not only the primary beneficiaries of such projects but often essential to the success of such projects. Declaring water and sanitation a human right, and consequently placing the responsibility for service provision on governments, threatens the efficacy and sustainability of projects if governments do not adhere to principles of gender sensitivity in the provision of WSS services. Governments must also be sensitive to criticism that grassroots organizations and NGOs are more successful in the development space because they gain trust within communities from face-to-face interactions and can better incorporate the needs of the community (Fernando 2006).

These concerns regarding the role of government create a significant issue for policy makers. While microfinance is a viable financing option for WSS services, and has a number of advantages over government funding of such projects, it does not as a matter of course foster responsibility from the government in these services. Herein lies the dichotomy between encouraging government participation in the water and sanitation sector and allowing development organizations and MFIs to take temporary control of the

sector to provide these urgently needed community services. One potential solution is the development of public private partnerships or collaboration efforts. It may be most beneficial for governments to work with MFIs to help provide funding for these services. Some microfinance programs do receive supplementary funding from international organizations in the form of subsidies (Arney, et al. 2008, Water and Sanitation Program 2011, Advani 2010). Governments could potentially provide these subsidies in order to increase government activity in water and sanitation service provision. However, the risk in providing government subsidies to MFIs is that this creates less incentive for MFIs to develop efficiently (CGAP 2009). Further research in this area is needed to determine if government subsidies may be an appropriate way in which to incorporate government funding into the microfinance sector in WSS service provision.

Microfinance and Gender Empowerment

Gender is also an important consideration in the scalability of microfinance. Microfinance institutions pride themselves on the number of women they have reached— as of 2010, 75% of MFI clients were women (Butler 2012). However, it is difficult to assess the contribution that microfinance has made to gender equality and the empowerment of women. Gender empowerment has been defined as a process “which creates an institutional environment that enables women to take ‘control over material assets, intellectual resources, and ideology’”⁹ (Fernando 2006). While microfinance

⁹ “The material assets over which control can be exercised may be physical, human, or financial, such as land, water, forests, people’s bodies and labor, money, and access to money. Intellectual resources include knowledge, information, and ideas. Control over ideology signifies the ability to generate, propagate, sustain, and institutionalize specific sets of beliefs, values, and

provides access to credit for women, this does not necessarily translate into the ability of women to obtain or control material assets or intellectual resources, or to control ideology as defined by Fernando. One of the central arguments in favor of microfinance is that it creates a “flexible space for women to interact as a group, initiate educational programs, and mobilize to achieve other dimensions of social change” (ibid.). However, microfinance alone is not sufficient to create social equality for women. Critics of microfinance in the gender field note that “facilitating women’s access to physical resources through credit alone only partially addresses circumstances of social injustice” (ibid.). Simply gaining access to resources may not challenge or overcome existing social structures that impede women from gaining control and ownership over such important resources.

Fernando (2006) criticizes microfinance for reinforcing the existing social hierarchies in society rather than challenging them. The pressure exerted on women to repay loans is a prime example of this reinforcement. As seen in the Gramalaya case study, women are sometimes forced to turn to their husbands to repay loans, arguably taking a backwards step on the path to empowerment. MFIs may disregard or downplay these types of scenarios by quickly equating the substantial number of women borrowers and high repayment rates with women’s empowerment. However, high repayment rates and the number of women borrowers are not necessarily valid indicators of empowerment and the role of women in their communities. In group loan models, women may be the

attitudes and behavior...Empowerment begins not only by recognizing the systemic forces that oppress them, but act to change existing power relationships. This requires a recognition and awareness of these forces that perpetuate women’s subordinate position should be followed by a reversal of values, attitudes, indeed, their entire world view” (Fernando 2006).

technical loan borrowers but the entire family is often deemed responsible for paying back the loans. Some studies also show that a “significant portion of credit given to women was actually controlled by men” (Fernando 2006). Therefore, looking solely at repayment rates disregards important data on the role of women and the ability of women to improve their financial and social status and to control and repay loans independently from men. Moreover, it is difficult to discuss empowerment and to measure the effects of these programs on empowerment and gender equity when neither the programs nor the studies consider the borrowers’ or the specific communities’ perspectives of empowerment.

Some commentators suggest that an improvement in women’s bargaining power is a good indicator of gender empowerment. They argue that one way in which to measure gender empowerment is by extrapolating the bargaining power of women from their household expenditure power. For example, if women have access to credit and can increase their wealth or income, they will typically invest this money in the household by purchasing more food. With improved diet and nutrition comes improved health and greater resistance to disease, which ultimately results in a greater capacity for family members to work, learn, and enhance productivity (Fernando 2006, Weigelt 2012). While this is clearly a positive aspect of improving access to credit for women, it is still difficult to assert that existing social hierarchies have been changed or even challenged, despite the improvement in the quality of life of women.

Using microfinance for water and sanitation may overcome some of the hurdles faced by women in conventional microfinance projects (which provide credit to start small businesses). If women are given loans to build and maintain water supply and

sanitation systems, they will have the opportunity to gain ownership over water and sanitation resources. This increased ownership has great potential to improve the bargaining power of women, assuming the loan repayment program and training programs are strong and flexible enough to ensure women are able to repay the loans themselves.

Water, Sanitation, and Gender Empowerment

The use of microfinance to assist in the provision of water and sanitation services plays into the women's empowerment discussion in indirect as well as direct ways. As described above, improved access to water and sanitation for women and girls includes such direct benefits as: better health, enhanced dignity and safety, increased school attendance due to fewer illnesses and improved female sanitation facilities, and reduced physical stress from heavy water loads (Ivens 2008). In addition to the direct benefits of improved quality of life, as important are the indirect or consequential benefits that are sometimes overlooked. Such benefits include the fact that women participate in the planning and implementation of projects, allowing them to take control of intellectual resources. Including women in the decision-making process is shown to increase self-esteem and self-confidence—which can be important factors in and indicators of women's empowerment (Ivens 2008). However, given the intangible and indirect nature of these benefits, it is difficult to turn these qualitative measurements into quantitative data that can be manipulated and compared against other data sets.

Ivens (2008) and O'Reilly (2006) argue that improved access to water and sanitation does not necessarily contribute to women's empowerment or gender equality.

O'Reilly (2006) asserts that often the incorporation of women in WSS projects is a technical solution to the prior exclusion of women in WSS projects but does not necessarily challenge the status quo or “social processes that enable or disable that ‘effect’ [building a WSS system] (such as men’s control of household spaces) (O'Reilly 2010). Based on field work in Rajasthan, O'Reilly challenges the notion that gender empowerment occurs simply by involving women in the technical processes of WSS projects, i.e. building and maintaining WSS systems. She argues that including women in such projects may increase and not reduce the inequality of women and deflect attention from addressing the real causes of gender inequality. According to O'Reilly, too much focus on providing access to WSS and involving women in the technical provision of such services places “the problem and its solution on women’s shoulders to increase women’s work burden without tackling the fundamentals of women’s inequality” (O'Reilly 2010). O'Reilly argues that in order for women’s participation in WSS projects and access to WSS services to lead to empowerment, the process must recognize the “relational system” of gender, acknowledging the separate roles of men and women and challenging the power structure between them.

Another way of measuring women’s empowerment is to determine the roles of men and women and the amount of time they spend in these roles. A common misconception is that the workload of women decreases with increased access to water and sanitation. Studies show that this assumption is not true and that women’s workload does not decrease with access to water and sanitation and women do not engage in activities that “strengthen their empowerment” after gaining access to water (Ivens 2008). For example, some women are forced to work in the fields with their husbands with their

freed time. While some may argue this is positive change, as women are engaging in other work with their free time, others argue that it gives men in the community increased bargaining power to determine what women will do with this freed time (Fahaj 2012). Therefore, it is important to consider if this is work that women would like to do when determining if women are better off with increased access to WSS services.

Despite these findings, access to water and sanitation can also be a jumping off point for women to gain additional bargaining power in society. Women often are not able to own land and therefore do not have a legal right to water (ibid.). This hinders the bargaining power of women, especially in agricultural areas, as they lack the ability to control the water source. Gaining ownership over water sources may challenge the current power structure in societies where women often do not have ownership of land or physical resources.

When determining the ability of microfinance and WSS services to improve gender empowerment, each project and community should be considered separately. Improving access to these resources can be highly beneficial to women but can also have negative consequences. For example, installing pour and flush latrines improves a community's access to sanitation services significantly. However women, often discontentedly, assume the additional burden of fetching the additional water needed for the latrines, perhaps putting them in a worse position for empowerment than before the installation of the latrines (O'Reilly, Gender Empowerment in Water and Sanitation Projects 2012).

In order to accurately evaluate the impacts of microfinance and improved access to water and sanitation on women, sex disaggregated data must be collected and

indicators for women's empowerment must be identified. It is important to disaggregate data based on gender due to the different roles and perspectives of men and women on water use and sanitation services. The Gender and Water Alliance (GWA) advocates that all donors and governments include gender impact assessments for all water projects to ensure gender equality is maintained through project development, implementation, and capacity building efforts (Lidonde, et al. 2002). Separating data based on gender is an important way to “distinguish differences in needs, interests, and priorities in water resources management” of men and women (ibid.). Due to the separation of roles of men and women, each sex may oftentimes be considered a separate stakeholder in project development and resource management. Therefore, in order to develop a water management system (either for water supply or for sanitation), all stakeholders must be considered and included in the decision-making process and evaluation stages. Separating data collected by gender will provide a better indication of project success.

Savings

Sustaining the practice of saving beyond loan repayment is also important. Critics of microfinance in the water and sanitation sector cite microfinance as a good means to provide the capital costs for improved infrastructure. However, they claim it cannot be used for operation and maintenance, which makes it an unsustainable source of funding for water and sanitation service provision (Zeug 2011). While it is certainly true that microfinance typically only covers the capital cost of water and sanitation provision, there is potential for borrowers to meet the operation and maintenance expenses based on the savings skills that they must acquire to pay back the loans in the first place. As seen

in the KWDT study, when microfinance is used in conjunction with capacity building training for borrowers, borrowers may create economic opportunities from improved access to water and sanitation. Increased income or savings may be used to sustain the water and sanitation systems.

Alternative Financing Mechanisms

While the focus of this paper has been on microfinance as a funding mechanism for WSS services, it is also important to take into consideration additional funding mechanisms that are available to provide WSS services. Revolving funds are used by both MFIs and NGOs, more often the latter, and provide a type of community loan. Once the loan is repaid, the money is returned to the lending body and then re-lent to other groups. This is similar to two models seen in the case studies: KWDT and LAGEMYAM. In the KWDT model, women in each group received loans one at a time, with the next woman in the group receiving the loan money that the previous woman had repaid. The LAGEMYAM case study in Wogodogo also illustrates the revolving fund scheme. NGOs are typically the lenders for revolving funds in developing countries and are perhaps more well-suited to manage revolving funds than MFIs because there is less pressure to return profits on revolving loans. Often, revolving loans have very low interest rates, if at all, and thus are less suitable for MFIs.

Grants and donations from developed countries and international organizations have been common sources of funding in the WSS sectors. While grants remove the financial burden of service provision from communities and governments, they are not sustainable sources of funding. Communities in which WSS services have been provided

by grants are less likely to take care of the system, as they are less likely to feel ownership or take responsibility for the maintenance of the source.¹⁰ Studies have shown that requiring financial capital, in addition to human capital, from communities for WSS projects improves the sustainability of the system as a sense of ownership and responsibility is created from the financial investment(Waldorf 2012). Therefore, grants may be useful for providing WSS services, especially in areas of extreme poverty, as long as the grant does not cover the entire cost of the system.

VII. Conclusion

Based on the case studies, best practices from MFIs and NGOs can be extracted to guide future microfinance projects and enhance the efficacy and scalability of microfinance for WSS. The demonstrated demand for microfinance loans in the WSS sectors, as evidenced by Mehta (2008) and Arohan (2012), confirms the potential for the growth of microfinance services in this industry. However, future projects must take into account the challenges experienced in the field in order to offer effective microfinance services in WSS service provision.

The internal structure of microfinance institutions is critical, especially when providing micro-

Preconditions for Microfinance Success in WSS:

- Funding to provide educational programs and maintain low interest rates
- Educational outreach programs for women on savings skills and capacity building
- Group loans or revolving funds help build community financial and social support
- Social and financial indicators to determine project impact
- Community driven demand for WSS services

credit loans for WSS. As seen in the Gramalaya case study, the efficiency of MFIs can

¹⁰ Concluded from WASHCost Community Reports (see footnote 5).

affect the repayment rates and success of the institution from a lending perspective. Fair and equitable interest rates must be set to ensure that borrowers can repay loans and to restrain MFIs from becoming overly profit driven. This may be best accomplished by creating partnerships between MFIs and NGOs for micro-credit loans in the WSS sector. Such partnerships will help keep MFIs focused on the social and environmental impacts of their loan services. NGOs, due to the social impact focus of many, have additional incentives to allocate resources to educational programming on loan repayment skills, capacity building and training for women, and integrating gender sensitivity into project development, implementation, and evaluation. Such efforts will not only improve chances of project success but they will also guarantee the sustainability of WSS services.

MFI programs would additionally be enhanced if saving programs were offered in conjunction with micro-credit loans. Savings programs encourage individuals to put money in a safe place (i.e. in a bank account rather than in their homes where it can be

stolen or ruined in a natural disaster) and to grow a sum of money that can be used as security.

Not only is this important for financial stability, but it can also ensure that borrowers have enough capital for the operation and

Pre-existing conditions cautioning against the use of Microfinance for WSS:

- Community unwilling to pay for WSS services
- Inadequate education services on WASH
- Inadequate education services on savings skills
- Disregard of gender sensitivity in project implementation
- Government policies that may inhibit microfinance institutions

maintenance of WSS systems after the initial capital cost is covered by the micro-credit loan. Although there are policy barriers in some countries that prevent MFIs from

offering savings programs alongside loan services, MFIs should consider expanding programs where they can.

Important to microfinance in general is an overarching credit bureau that can regulate the credit rating of borrowers to make sure loans are not taken out to repay existing loans. Recently, as exemplified in India in 2010, borrowers of micro-credit loans could take out loans from different MFIs to cover existing loan payments, due to the large supply of MFIs in India and ease of obtaining loans from different institutions, as there was no credit bureau system that keeps track of borrower loan activity (CGAP 2010). In order to ensure the success of MFI projects, in general and in the WSS sector, MFIs must determine a method of tracking loan histories of borrowers.

In order to determine the impact of WSS projects, MFIs should use both social and financial indicators. Following the indicators used by WaterPartners in the Gramalaya case study, MFIs should measure the degree of improved access to WSS and the indirect consequences from improved access. Such indicators include: the time to access water, use of improved WSS services, number of cases of diarrhea, rates of open defecation, and other relevant measurements. Data should be collected and disaggregated based on gender in order to determine the impacts of the project on gender dynamics. Measuring project success based on sex disaggregated data will ensure that MFIs and NGOs keep gender a focus of projects during the implementation and planning phases. However, collecting this additional data is often expensive. It will be important for MFIs and NGOs to take these additional costs into account when creating project and business plans.

Finally, when determining which locations and communities may be best fit for MFI services, organizations should evaluate the demand for loan services in the WSS sector. The success of many projects rests largely on the community or borrower's willingness to pay for WSS and sanitation services. Demand for credit must be driven by the borrower to ensure that loans are used properly.

VII. Recommendations

This paper explores the role of women in the nexus between microfinance and access to WSS services. While there are important take-aways from the research and case studies provided above, there remains a significant amount of research and work to be done in the microfinance for WSS space.

1. Net-worth of borrowers: In order to truly understand the success of microfinance projects, studies should measure the net-worth of borrowers before and after the initiation of loan programs. As discussed in the case studies, too often are repayment rates the only financial indicators used to determine the success of loan programs. It is important to understand if loans used for improving access to WSS services are increasing, decreasing, or maintaining the same net-worth of the borrower.

2. Regional Barriers to Microfinance: Additional work is needed to conclude which regions are especially fit for microfinance, i.e. why is microfinance more successful in Southeast Asia than in Sub-Saharan Africa? Answering this question will allow for the adaptation and expansion of microfinance services to meet the needs of different communities.

3. Reaching the poorest of the poor: Which financial mechanism is best at providing sustainable WSS services to the extremely poor? Additional research is needed to determine which financial mechanism is best for differing levels of wealth.

4. Psychological barriers: Why are some communities reluctant to use improved sanitation facilities? What barriers exist to the uptake of hygienic advice? Westerners often think that simply providing access to improved drinking water sources and improved sanitation systems will automatically result in the uptake of improved practices. However, as O'Reilly explores in her research, this is often not the case.

4. Life-cycle costs: The Gates Foundation funded the WASHCost project in 5 regions of the world to determine the lifecycle costs of providing water and sanitation services. Results from this study, which concludes in 2012, should be integrated into development projects for WSS to determine the exact financial costs of providing such services. MFIs may also be able to incorporate this into the structure of their loan programs to provide sustained capital for WSS service provision.

Bibliography

Advani, Rajesh. "Using Market Finance to Extend Water Supply Services in Peri-Urban and Rural Kenya." International Finance Corporation. November 2010. (accessed February 3, 2012).

Arney, Heather, Sait Damodaran, Michaela Meckel, Andrew Barenber, and Gary White. *Creating Access to Credit for Water and Sanitation: Women's Self Help Groups in India*. Prod. IRC Symposium: Sanitation for the Urban Poor Partnerships and Governance. Delft, The Netherlands, November 19-21, 2008.

Arohan Financial Services Private Limited. *Water and Sanitation Survey*. Kolkata, January 2012.

Bavuma, Rehema, interview by Abby Waldorf. "Project Officer." *Katosi Women Development Trust at the 6th World Water Forum*. Marseille, (March 15, 2012).

Butler, Richard. "Microfinance: Sudden Impact." Philadelphia, Pennsylvania, March 28, 2012.

CGAP. "Andhra Pradesh 2010: Global Implications of the Crisis in Indian Microfinance." November 2010. www.cgap.org/gm/document-1.9.48945/FN67.pdf (accessed April 29, 2012).

—. "Government's Role in Microfinance." *CGAP Advancing financial access for the world's poor*. January 9, 2009. <http://www.cgap.org/p/site/c/template.rc/1.26.4903/> (accessed April 18, 2012).

Fahaj, Robina. "Mainstreaming gender in irrigation modernization planning." *Women's Preconference to the World Water Forum*. Marseille, March 10, 2012.

Fernando, Jude L., ed. *Microfinance: Perils and Prospects*. London: Routledge, 2006.

Human Rights Council. "18/1 The human right to safe drinking water and sanitation." Resolution, Human Rights Council, United Nations, 2011.

Ivens, Saskia. "Does Increased Water Access Empower Women?" *Development Journal* (Society for International Development) 51 (2008): 63-67.

Jacobs, Inga. *Menstrual Hygiene Management Women's Preconference to the World Water Forum 6*. Marseille. March 10, 2012.

Jhabvala, Renana. *Lecture: The Indian State and Organizations of the Poor: Lessons from the SEWA Experience*. UPenn Center for the Advanced Study of India, Philadelphia. April 11, 2012.

JMP. "The Global Trend." *WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation*. WHO-UNICEF Joint Monitoring Programme. 2010. <http://www.wssinfo.org/guided-tours/access-to-watsan/tour5/> (accessed January 30, 2012).

—. "Types of Drinking Water Sources and Sanitation." *WHO-UNICEF Joint Monitoring Programme for Water Supply and Sanitation*. WHO-UNICEF Joint Monitoring Programme. 2010. <http://www.wssinfo.org/definitions-methods/watsan-categories/> (accessed January 30, 2012).

Lidonde, Rose Atemo, Dick de Jong, Nafisa Barot, Begum Shamsun Nahar, Niala Maharaj, and Helen Derbyshire. "Advocacy Manual for Gender and Water Ambassadors." Gender and Water Alliance. December 2002. http://www.wsscc.org/sites/default/files/publications/gwa_advocacy_manual_for_gender_and_water_ambassadors_2002.pdf (accessed January 15, 2012).

Mehta, Meera. "Assessing Microfinance for Water and Sanitation: Exploring Opportunities for Sustainable Scaling Up." *The Gates Foundation*. Bill & Melinda Gates Foundation. July 5, 2008. <http://www.gatesfoundation.org/learning/Documents/assessing-microfinance-wsh-2008.pdf> (accessed October 20, 2011).

Mihelcic, James R, Lauren M Fry, Elizabeth A Myre, Linda D Philips, and Brian D Barkdoll. *Field Guide to Environmental Engineering for Development Workers: Water, Sanitation, and Indoor Air*. Reston, Virginia: American Society of Civil Engineers, 2009.

Netherlands Water Partnership. "Microfinance for Water, Sanitation and Hygiene: An Introduction." Edited by Catarina Fonseca, Marieke Adank, Deidre Casella, Martine Jeths, Peter van der Linde and Bianca Dijkshoorn. IRC International Water and Sanitation Center. October 2007. <http://watercredit.org/wp-content/uploads/2010/08/IRC.pdf> (accessed January 15, 2012).

O'Reilly, Kathleen. "Combining sanitation and women's participation in water supply: an example from Rajasthan." *Development in Practice* (Routledge) 20, no. 1 (January 2010): 45-56.

O'Reilly, Kathleen, interview by Abby Waldorf. *Gender Empowerment in Water and Sanitation Projects* Marseille, (March 13, 2012).

The Netherlands Water Partnership and IRC. "Microfinance for Water, Sanitation and Hygiene: An introduction." *Water.org*. October 2007. <http://watercredit.org/wp-content/uploads/2010/08/IRC.pdf> (accessed January 28, 2012).

UNFPA. *Gender Equality: Empowering Women*.

<http://www.unfpa.org/gender/empowerment.htm> (accessed March 30, 2012).

UN-Water. *UN-water Global Annual Assessment of Sanitation and Drinking-water (GLAAS) 2012 Report: The Challenge of Extending and Sustaining Services*. World Health Organization, 2012.

United Nations. "Gender, Water and Sanitation Case Studies on Best Practices." Office of the Special Adviser on Gender Issues and Advancement of Women. 2006. (accessed March 2012).

United Nations General Assembly. "64/292. The human right to water and sanitation." Resolution, General Assembly, United Nations, 2010.

United Nations. *Goal 7: Ensure Environmental Sustainability*. United Nations. 2010. <http://www.un.org/millenniumgoals/envIRON.shtml> (accessed January 30, 2012).

United Nations. *International Decade for Action 'Water for Life' 2005-2015: Financing Water*. 2012. <http://www.un.org/waterforlifedecade/financing.shtml> (accessed May 25, 2012).

Waldorf, Abby, participant. "Women's Preconference to the World Water Forum." Marseille, March 10-11, 2012.

Water and Sanitation Program. "Financing Small Piped Water Systems in Rural and Peri-Urban Kenya." September 2011. (accessed February 3, 2012).

Water.org. "About WaterCredit." *WaterCredit*. Water.org. 2011. <http://www.watercredit.org/about> (accessed November 19, 2011).

—. *Hand In Hand Lending Flow Chart*. July 2010. <http://watercredit.org/wp-content/uploads/2010/08/HiH-lending-flow-chart-July-2010.jpg> (accessed November 4, 2011).

—. "WaterCredit Executive Summary." *WaterCredit*. Water.org. June 2011. <http://watercredit.org/library/watercredit-executive-summary/> (accessed November 11, 2011).

WaterAid America Inc. *Statistics*. WaterAid America Inc. http://www.wateraidamerica.org/what_we_do/statistics.aspx (accessed November 19, 2011).

WaterAid. "Off-track, off-target: Why investment in water, sanitation and hygiene is not reaching those who need it most." *WaterAid Report*. WaterAid. November 2011. <http://www.wateraid.org/documents/Off-track-off-target.pdf> (accessed January 15, 2012).

Weigelt, Keith. "Introduction to Microfinancing." Philadelphia, PA, January 11, 2012.

WHO/UNICEF JMP for Water Supply and Sanitation. *Progress on Drinking Water and Sanitation: 2012 Update*. Progress Report, UNICEF and World Health Organization, 2012.

Zeug, Heidrun. "Analysis: Potential of microinsurance to sustain water and sanitation service." Water for People. December 2011.
<http://tap.waterforpeople.org/usercontent/1/0/56560001/9/InsuranceDeskStudyFinalPublic.pdf> (accessed January 31, 2012).