EXPANDING WATER SUPPLY AND SANITATION IN SUB-SAHARAN AFRICA USING MICROFINANCE

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Improved access to financial services is seen as crucial to achieving the Millennium Development Goals (MDGs). One of the MDGs includes halving the number of people without access to a safe and sustainable supply of drinking water and basic sanitation by 2015. The availability of financial services is an important factor that empowers the poor to build their own way out of poverty in a sustainable way. Research has shown that increased income levels lead to higher investment in health, education, water and sanitation. In many developing countries, there is a significant credit gap for low-income people. Due to lack of collateral and high transaction costs for small loans, the poor are systematically excluded in the provision of financial services. This situation has led to development of microfinance institutions (MFI), which provide the poor with credit, savings and insurance products. This paper provides an outline of the MDGs. The interactive relationship between the goals is discussed. The gap between current levels of investment and the levels required to meet the MDGs of expanding water supply and sanitation is outlined. Principles of microfinance are briefly discussed. The areas where Microfinance can be used to support investment are briefly assessed. These include lending to support poor households, financing projects at household level, offering social services, supporting rural community projects, and lending to private service providers. Ongoing research to assess the context in which Microfinance can be developed to play a role in extending water supply and sanitation in Sub-Saharan Africa is outlined. To date, the literature reveals that this subject has not been explicitly addressed elsewhere.

Keywords: microfinance, millennium development goals, sanitation, Sub-Saharan Africa, water supply.

INTRODUCTION

In recent years, the availability of water and sanitation has been highlighted as one of the most critical issues facing humanity. Low-income people bear a disproportionate share of the impact of lack of water supply and sanitation services. Only few poor people are connected to a water supply network. For those that have access, the installations have to be shared with many other people and the systems can be extremely unreliable. Improved water supply and sanitation can make a significant contribution to a country's development. In this paper the MDGs are briefly outlined. Their interactive nature is discussed. The role of water supply and sanitation expansion in helping to achieve the other MDGs is articulated. The role Microfinance in providing financial services to the poor to further accelerate this process and strengthen the sustainability of water and sanitation projects is assessed.

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Table 1: Millennium Development Goals: Source (UN, 2000)

Goal 1	Eradicate extreme poverty and hunger	
	Target 1	Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.
	Target 2	Halve, between 1990 and 2015, the proportion of people who suffer from hunger.
Goal 2	Achieve universal primary education	
	Target 3	Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.
Goal 3	Promote gender equality and empower women	
	Target 4	Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015.
Goal 4	Reduce child mortality	
	Target 5	Reduce by two thirds, between 1990 and 2015, the under-five mortality rate
Goal 5	Improve maternal health	
	Target 6	Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio.
Goal 6	Combat HIV / AIDS, malaria and other diseases	
	Target 7	Have halted by 2015 and begun to reverse the spread of HIV/AIDS
	Target 8	Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
Goal 7	Ensure environmental sustainability	
	Target 9	Integrate the principles of sustainable development into country policies and programmes and reverse the losses of environmental resources.
	Target 10	Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation.
	Target 11	Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers.
Goal 8	Build a global partnership for development	

THE MILLENIUM DEVELOPMENT GOALS

In September 2000, at the United Nations Millennium Summit, 189 Member States agreed to a set of time bound goals and targets. They range from halving extreme poverty to providing universal primary education. These targets are now commonly referred to as the Millennium Development Goals (MDGs). Table 1 provides a detailed statement of these goals. All United Nations Member States have pledged to meet the Millennium Development Goals by 2015. Target 10 of the MDGs is to halve the proportion of people without sustainable access to safe drinking water and basic sanitation. Although the targets were set in the year 2000, the baseline for assessment of water and sanitation coverage is 1990. So, for example, in Sub-Saharan Africa where 68 percent of the 504 million (1990 population) had no access to basic sanitation, the aim is to reduce that level to 34 percent of a much higher population envisaged in 2015 (935 million).

IMPORTANCE OF WATER SUPPLY AND SANITATION

Although improved water and sanitation coverage is just one target among many, it will make a significant contribution to achievement of the other MDGs. Investments in water and sanitation act as a catalyst for regional development. The availability of sufficient water is an important factor of production in agriculture and industry. It allows production of food for household nutrition as well as for sale at local markets and helps to eradicate extreme poverty and hunger. The number of extremely poor people in Sub-Saharan Africa has almost doubled since 1981 to 313 million people in 2001 (World Bank, 2006a). Improved water and sanitation contributes to poverty

eradication by avoiding time losses because of long-distance travel for water collection and time losses through illness or caring for ill family members. Time, energy and resources required to fulfill these basic tasks are freed for other economic activities. The time lost directly translates into lower productivity, since labour is the main productivity factor for poor people. Water-carrying burdens also affect school attendance, especially among girls. A girl that has to carry water for hours every day is neither left with the time nor the energy for schooling. Therefore, water and sanitation expansion will help to ensure that, by 2015, children everywhere can complete a full course of primary education.

Water makes a massive contribution to Goal 4, which seeks to reduce child mortality by two thirds. In 2003 the average under-five mortality rate was 171 deaths per 1,000 in Sub-Saharan Africa. In high-income countries the rate was less than 7 (World Bank, 2006b). For most of the deaths before age five, the cause is a disease or a combination of diseases and malnutrition that would be preventable in a high-income country. Improved quantities and quality of domestic water along with sanitation reduce morbidity and mortality for young children.

Number five of the Millennium Development Goals aims to reduce by three quarters, between 1990 and 2015, the rate of maternal mortality. Safe drinking water and basic sanitation are needed in hospitals to ensure basic hygiene practices following delivery. But also reduced labour burdens and health problems resulting from water portage do positively contribute to reducing maternal mortality risks. Malaria, AIDS and tuberculosis are among the world's biggest killers and have their greatest impact on poor people in Sub-Saharan Africa. The Millennium Development Goals intend to halve, by 2015, halt and begin to reverse the spread of these diseases. Better water management in human settlements reduces mosquito habitats and transmission risks of malaria. Additionally, safe drinking water and basic sanitation help to prevent water-related diseases such as cholera or trachoma (Hutton and Haller, 2004).

The environment provides goods and services that sustain human development. One step towards Goal 7, aiming to stop the unsustainable exploitation of natural resources, is an adequate treatment and disposal of wastewater. It not only contributes to better ecosystem conservation but also puts less pressure on scarce freshwater resources. Careful use of freshwater helps to prevent contamination of groundwater and therefore minimizes the costs of water treatment. The last Millennium Development Goal urges the United Nations Member States to build a global partnership for development. Although in history water has in some cases been a source of tension between nations, it can also be a catalyst for co-operation. Clearly, water and sanitation expansion is one goal among others, but it is important to emphasize its central role in complementing all the other Millennium Development Goals.

Table 2 shows the change in the percentage of people without access to basic

Table 2: Sanitation Coverage in Sub-Saharan Africa (millions): Source (UNICEF and WHO, 2006)

Year	**1990**	**2002**	**2015**	
Population	504.4	684.8	935.1	*(estimated)*
Served	163.5	248.1	617.2	*(required to meet the MDGs)*
Unserved	340.9	436.7	317.9	*(required to meet the MDGs)*
Unserved [%]	68 %	64 %	34 %	*(required to meet the MDGs)*

sanitation in Sub-Saharan Africa between 1990 and 2002. Although 84.6 million people gained access to sanitation facilities between 1990 and 2002, the number of people living without basic sanitation grew by 95.8 million (UNICEF and WHO, 2006). This increase is due to the steady population growth on the African continent. Population growth is a significant factor in the ability of countries to improve coverage of water supply and sanitation. With an annual population growth rate of 2.5%, Sub-Saharan Africa has the world's highest rates of increase in population (Population Resource Center, 2006). It is estimated that Sub-Saharan Africa's population will grow from 504 million in 1990 to 935 million people in 2015. This is equivalent to an increase of 85 percent in 25 years. Just to maintain its 1990 sanitation coverage level of 32 percent, Sub-Saharan Africa would have to ensure basic sanitation to an additional 135 million people by 2015. To reach the Millennium Development Goal of 34 percent of the African population without basic sanitation, 617 million people must have access to sanitation in 2015. Taking into account that the population is expected to have grown to 935 million people in 2015; service has to be provided for an additional 454 million people between 1990 and 2015, or 49,717 every day. Between 1990 and 2002, about 85 million people (19,309 every day) in Sub-Saharan Africa gained access to sanitation services. Although this is an enormous number, it is far too low with respect to the Millennium Development Goals.

With less than 9 years to go before 2015 the world is lagging far behind progress needed to attain the Millennium Development Goals in sanitation. Reaching the goals will be impossible without considerably increasing investments. Current spending on new water infrastructure in developing countries is roughly US $ 80 billion per year. This amount at least has to be doubled in order to reach the Millennium Development Goals in water and sanitation. Finance needs to be drawn from all sources and developing special Microfinance services seems to be one promising approach especially for poor people.

PRINCIPLES OF MICROFINANCE

Until recently, it was assumed that people living at the margins of subsistence are least able to contribute to an economy's savings. The poor, it was concluded, can't save. However, experience has shown that low-income people have the capacity to save and do so through many channels. Though poor people only have little income, they are definitely able and willing to save. But poor people are not only able to save, they are also creditworthy. Money lenders, friends or neighbours have always lent to the poor.

Most poor people in the world do not have access to financial services: neither for savings nor for loans. Despite a huge demand, these services are unavailable to over 80 percent of all households in developing countries (Wright and Dondo, 2001). Such a credit gap in developing countries is largely due to the fact that no formal banking sector exists in many rural areas. The lack of financial services forces people to travel long distances to urban banks. This involves time, cost and the risk of carrying cash on long journeys. If formal financial systems exist, they generally reject poor customers because of high transaction costs and lack of collateral. Additionally, it is reported that many state-owned banks are notoriously unreliable (Wright, 2005). Lengthy delays, unpredictable bribes and arbitrary behaviour are no exception. Informal money lenders also often lack the required capacity and claim extortionate interest rates of 120 to 200 percent (Hassan, 2002). Microfinance Institutions have the potential to tread the narrow line between the formal banking sector and informal

moneylenders. Because of their non-governmental character, they do not have corruption inherent in their system and their standardised products prevent bureaucracy. In contrast to the informal financial sector, Microfinance Institutions have sufficient resources to deliver reliable services to their customers.

Microfinance Institutions (MFIs) offer the supply of loans, savings and other financial services to people who do not have access to mainstream banks. In addition to financial services, some Microfinance Institutions also provide social intermediation programmes such as health care or management capabilities. Target clients of Microfinance Institutions are low-income people without tangible assets, who often live in remote rural areas. These people are not considered as attractive customers by formal banks. The amounts poor people borrow are too small, they often live far away; some of them are illiterate and cannot offer any security for the loan. All these factors significantly boost transaction costs. Microfinance Institutions attempt to by-pass some of the disadvantages connected with lending to poor people by employing special techniques: In order to make lending to the poor financially viable, Microfinance Institutions have to offer services that fit the preferences of low-income people. These services might include short-term loans, unrestricted loan use and customer-friendly approaches. Microfinance Institutions also have to standardize the whole lending process, make applications very simple to minimize staff time per loan. In addition, recruiting staff from local communities with lower salary expectations helps to keep operation costs down. One of the key points is the loan repayment rate. Microfinance Institutions have to motivate their clients to repay loans. This is achieved by primarily lending to women, using the mechanism of joint liability groups and offering incentives. It is important for Microfinance Institutions always to charge full-cost interest rates and fees. Although interest rates are higher than commercial bank rates, poor people have shown a willingness and ability to pay such rates, provided they get the service they desire.

The microfinance movement has gained momentum due to several success stories. The World Bank estimated in 2004 that there were over 7,000 microfinance institutions worldwide, serving over 16 million poor people. The global distribution of Microfinance Institutions is however not uniform. Microfinance in Sub-Saharan Africa lags behind developments in Asia and Latin America. More than 90 percent of the loan and savings accounts offered by Microfinance Institutions are concentrated in Asia. Only about 5 percent of all accounts can be found on the African continent (Remenyi, 2005). The microfinance sector in Sub-Saharan Africa is still young and most institutions are in their start-up or consolidation phase. Market size and penetration are both relatively low. The same is true for financial performance and product diversification. In order to be able to support water and sanitation projects, the outreach of Microfinance Institutions in Sub-Saharan Africa has to be increased on a grand scale.

MICROFINANCING OF WATER AND SANITATION PROJECTS

It has been articulated that improved water and sanitation is a key factor for the achievement of the whole set of the MDGs. An important external factor is the provision of financial services to the poor. Availability of Microfinance for poor households is a critical contextual factor with strong impact on the achievement of the Millennium Development Goals (Littlefield *et al.*, 2003). Access to financial services forms a fundamental basis on which many of the other necessary interventions depend. According to Littlefield *et al.* (2003), improvements in health care, nutritional

advice and education can be sustained only when households have increased earnings and greater control over their financial resources. Financial services thus reduce poverty. The beauty and impact of microfinance is that, as programs approach financial sustainability, they can reach far beyond the limits of scarce donor resources. Both, Microfinance and the Sub-Saharan African context are dynamic and diverse. Therefore, no certain microfinancial model is perfect in supporting the expansion of improved water and sanitation. There is a whole range of possible approaches. Some examples are discussed below.

Strengthening poor households

Low risk-bearing capacity and their high vulnerability make especially the poor dependant on credit and saving products. Availability of financial services helps poor people to avoid serious shortfalls and therefore increase their capacity to bear risks. Zeller and Sharma (2000) show that the poorest households spend 91 percent of their consumption budget on food. As a result, a drop in their earnings or unexpected expenditures could have devastating consequences on the food situation of the family. A declined food situation affects health and labour of the family members. A vicious circle begins, since labour is the most important production factor for poor people and in many cases the only one. The maintenance of labour productivity is central for securing income. However, many Microfinance Institutions are still insisting on providing loans for productive purposes only. They should be aware of the fact that borrowing during adverse times is an integral part of the livelihood system of the poor. Financial products that allow only for production credit do not prevent the poor from taking consumption credit. Such a policy only urges customers to borrow from informal moneylenders or neighbours instead of going to much more reliable Microfinance Institutions. Forcing poor people to make use of informal financial systems often worsens their situation. Informal moneylenders do not only claim usurious interest rates for their loans, they are also very unreliable in terms of saving products. Recognizing the above mentioned situation, Microfinance Institutions should provide poor households with adequate savings products and consumption credit, if required.

Once Microfinance Institutions are supporting their poor customers with tailored loan and savings programmes, households are more likely to absorb adverse shocks. The poor use financial services not only for business investments but also to invest in health and education, to maintain their food supply and to manage household emergencies. Evidence around the world demonstrates that access to financial services enables poor people to increase their household incomes (Littlefield, 2003). Higher incomes inevitably lead to investments in housing, water and sanitation.

Financing projects at household level

Many households in rural areas are also their own service providers. They may use their own shallow family wells for water and their own latrines for sanitation (Mehta and Virjee, 2003). Microfinance Institutions could offer special loan products for improved water and sanitation at household level. Such specialised loan products should be linked with governmental or non-governmental promotion programmes. Governments or NGOs raise consciousness among the poor concerning special water or sanitation aspects, offer technical support and provide partial subsidies. The support is needed in order to provide cost-effectiveness and quality control. Besides money, people taking part in such programmes are also required to contribute labour and basic materials. After successful demand promotion, it is up to Microfinance

Institutions to enable the poor to administer their own financial contribution either by granting them loans or by offering them saving products. Another possible use for microfinance at household level can arise, if a local service provider offers a connection to improved water services. Microfinance Institutions are not only able to grant the required amount of money for the connection of a household, but they can even design a tailored programme for the whole settlement. The existence of a Microfinance Institution in a rural settlement alone, combined with its willingness to support such programmes can be the crucial factor for the local utility to provide services to the low-income customers.

Offering social services

Along with financial services, some Microfinance Institutions also provide comprehensive social services. These services help poor customers to overcome their poor housing, health and education conditions. Microfinance Institutions encourage people to build homes, grow gardens and install basic sanitation facilities. They are offering a range of training programmes in maternal health, nutrition and child care. Such programmes are raising consciousness among the poor and provide the required knowledge to improve their situation. In view of the Millennium Development Goals, Microfinance Institutions should consider to provide more social services along with their financial products. Short, simple preventive care messages on safe drinking water and basic sanitation are not expensive but can have a significant impact. Social services are even more effective if they are combined with special credit products for housing, water or sanitation.

Supporting rural community projects

In rural settings, community provision of water dominates. Rural communities are running thousands of different schemes in Sub-Saharan Africa. For most new projects, communities are involved in design and implementation and have full responsibility for operation and maintenance. The initial capital costs are in most cases met by governmental subsidies and the community contribution is often about 5 to 10 percent (Mehta and Virjee, 2003). However, in many NGO projects communities are required to pay a much higher share. It is also becoming more common for rural communities, to develop water projects tailored to their special needs through their own effort and funding. All these cases, though varying in the amount of money required, largely depend on access to financial services. Microfinance Institutions could make an important contribution to the success of such rural water and sanitation projects. Availability of credit is also a key factor in rehabilitation projects. In the past, government run projects often collapsed due to poor design, insufficient funds and lack of maintenance. Communities might wish to rehabilitate such projects and manage them on their own account. Again, besides a proper planning and management, initial credit often is the restricting factor. In most countries, government funding is available for new investments but not for meeting the costs of repairs or augmentation of services. It is a key factor for the sustainability of community-based water projects to ensure that finance is available for major repairs and maintenance. Without proper maintenance capital assets are wasted and the success of the whole project is in danger. Such a failure often affects the supply to thousands of people, something that would have been preventable with one loan at the right time. In some cases, Microfinance Institutions lend the required amount of money directly to the community-based service provider, who gets his revenues from

the user fees. People from the community paying their monthly fees would also most certainly be interested in savings products or loans offered by the financial institution.

Lending to private service providers

There is an increasing recognition of the important contribution small service providers are making, especially in improving access for the poor in rural and sub-urban areas. It is suggested that over half of the residents in urban areas in Sub-Saharan Africa depend upon nonutility sources of water, and 80 percent depend upon nonutility sanitation solutions (Mehta and Virjee, 2003). Private service providers are involved in production and supply chains that enable their poor customer to access water and sanitation even in remote, unconnected areas. The providers strongly vary in size and outreach, depending on the kind of service they offer. The most basic service available is offered by water vendors, who deliver water directly to its point of use. They carry containers of water to the customers, using handcarts or animals for transport. The price for water ranges between US$ 2 and 6 per cubic meter and the costs to start such a business is approximately US$ 100. Water kiosks require a larger initial investment of roughly US$ 1,000. They often operate in informal settlements and sell their water at a special kiosk rate (US$ 0.6 to 1.5 per cubic meter). Kiosks may include storage facilities or simply consist of a standpipe. Water truckers supply high-volume customers, including commercial buyers. Especially in cities with unreliable utility service there is a strong demand for this service. With about US$ 15,000 the initial investment required for water trucks is rather high.

Although the role of private service providers is significant, their demand for credit often remains unfulfilled. The lack of access to credit for capital investments is often the main constraint to new entry. In most cases the providers rely on their own savings and informal borrowings from family and friends. But not only capital for market entry is a problem. Many successful running businesses face severe problems when larger amounts of money are required for maintenance or enlarging business activity. Access to credit for necessary investments would be a great relief for private service providers. Especially in case of water vendors and water kiosks, Microfinance Institutions are able to exactly offer the product required by the private providers. Governments should recognise the present and potential role of private service providers and develop a supportive framework. Private service-providers should not be excluded in national water strategies, but should play an important role in official development plans instead.

RESEARCH OBJECTIVES, AIMS AND METHODOLOGY

In many countries, there are few evaluations of new interventions and this often leads to stagnation in development progress. Governments and NGOs are constantly trying new approaches, but unless there is some systematic evaluation of these programmes, there is no certainty that the chosen programme really was the best option. In the case of using Microfinance Institutions to support water and sanitation projects, there is need for a clear assessment of what works, what does not and why. Such an evaluation has to consider the particular country settings (history, politics, institutions, etc.) as well as local particularities (infrastructure, education, ethics, etc.) This is the overall objective this research which is being undertaken with specific reference to the potential of Microfinance in the water sector in Sub-Saharan Africa. The research work is still in its preliminary stages and the specific aims of the study are to:

- Assess the role of microfinance in funding small development projects

- Analyse the extent to which microfinance has been adopted in Sub-Saharan Africa
- Evaluate the effectiveness of Microfinance programmes
- Assess the potential of using Microfinance to fund projects in the water and sanitation sectors
- Analyse the barriers to expanding water supply and sanitation in Sub- Saharan Africa
- Develop guidelines that can be adopted by Microfinance institutions, NGOs and local communities to expand water supply and sanitation using Microfinance.

This research will utilise both qualitative and quantitative research methods. Primary data will be collected using structured interviews, focus groups and postal questionnaires. In addition, case studies will be used based on a selection of Microfinance Institutions and programmes. An ongoing pilot study in the capital city (Kampala) in Uganda will be completed shortly. It is anticipated that the study will then be extended to other poor urban centres in Uganda namely Jinja, Masaka and Mbale, etc. Comparative analysis methods will be used to assess qualitative data. Quantitative data will be analysed using standard computer packages such as MINITAB and SPSS. Qualitative and quantitative relationships will be explored using standard descriptive and inferential statistical tests such as the Chi-squared and F-tests.

CONCLUSIONS

It is estimated that at the present time, over 1.1 billion people are without access to improved water supply and over 2.4 billion people lack access to basic sanitation. Sub-Saharan Africa has the lowest total water supply coverage of any region. The situation is worse in rural areas. One of the MDG is to halve the proportion of people without access to water supply and basic sanitation. We are over a third way through the 15-year target period and the world is not on target to meet this goal. It has been argued in this paper that many of the Millennium development challenges are interconnected. For example, lack of education and poor health may be the results of poverty. However, whilst the root causes of poverty are connected, it is also true that solutions are connected. It has been argued in this paper that providing clean water can accelerate the achievement of other development challenges. There is, however, a significant gap between current levels of investment and the investment required for this purpose. All viable sources of capital must therefore be mobilised to support development. Microfinance is one source that has not been adequately tapped in Sub-Saharan Africa. It offers low-income people access to financial services they would otherwise not have. This access to saving and loan products can enable the poor to actively contribute to development and build their way out of poverty in a sustainable way. It should be emphasized that microfinance is not a magic cure for poverty or water supply and sanitation problems. However, Microfinance can be applied to strengthen poor households, fund water supply and sanitation projects at household and community level, fund private water supply service providers and extend social services. There is no single intervention that can defeat poverty alone or ensure universal water supply. Expanding water supply will require funding from many sources and action on many fronts.

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