

Bringing Water to Where It is Needed Most

INNOVATIVE PRIVATE SECTOR PARTICIPATION IN WATER & SANITATION



In partnership with Australia, Austria, Brazil, Canada, France, Ireland, Italy, Japan, Kuwait, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, the United States, the Public-Private Infrastructure Advisory Facility, the Global Partnership on Output-Based Aid, the Private Infrastructure Development Group, the African Development Bank, the Asian Development Bank, the Brazilian Development Bank, the Caribbean Development Bank, the Central American Bank for Economic Integration, the European Investment Bank, the European Bank for Reconstruction and Development, the Inter-American Development Bank, the Infrastructure Consortium for Africa, and the Islamic Development Bank.



THE WORLD BANK



IFC

**International
Finance Corporation**
World Bank Group

Disclaimer

SmartLessons is a World Bank Group program which enables development practitioners to share lessons learned in development operations. The findings, interpretations, and conclusions expressed in these papers are those of the authors and do not necessarily reflect the views of IFC or its partner organizations, the Executive Directors of the World Bank or the governments they represent. IFC does not assume any responsibility for the completeness or accuracy of the information contained in this document.



This publication is printed using Ecoprint Versa 100 and New Leaf Reincarnation matte papers, and Ecoprint inks and process. Printing 2500 copies saved: 8389 pounds of virgin wood, 3633 pounds of greenhouse gases, 1315 pounds of solid waste, 12336 gallons of liquid waste, 10 pounds of harmful chemicals, 4 cubic yard of landfill space, and 1888 kWh of electricity.

Foreword

Harnessing water for people to use is one of the world's greatest development challenges. Whether the water provides clean, sustainable energy, or delivers something safe to drink to a village for the first time, water plays a critical role in people's lives.

Both IFC Advisory Services in Public-Private Partnerships and the Water and Sanitation Program are committed to bringing the finance, skills, and expertise of the private sector to help address the water challenge.

Difficult problems need varied and pioneering solutions. In this Smart Lessons brochure we share an innovative and diverse range of initiatives from across the World Bank Group. The variety of lessons and experiences in this publication is inspiring, ranging from the Water Footprints Network that supports businesses improving their water use efficiency to the innovative financing mechanisms enabling the expansion of rural water access in Kenya. We are particularly pleased to see sanitation featuring prominently in the publication. The Millennium Development Goal target for sanitation is probably the toughest to achieve, and we need to deploy the skills and expertise of the private sector if the 2.6 billion people currently without access to sanitation are to be reached.

We have the greatest impact when we work in partnership. This publication not only presents partnerships between the public and private sectors, but also represents the growing depth of the partnership between our two organizations. We hope you will find these lessons an interesting and thought-provoking contribution to the debate on water and sanitation.



Laurence Carter, Director
IFC Advisory Services in
Public-Private Partnerships



Jae So, Manager
Water and Sanitation Program



Table of Contents

Using Market Finance to Extend Water Supply Services in Peri-Urban and Rural Kenya - <i>Rajesh Advani</i>	2
Thinking Outside the Pipeline: Venturing into Distributed Off-Grid Water Markets - <i>Vikram Kumar, Will Davies</i>	8
Improving Rural Water Service in Rwanda <i>Christophe Prevost, Bruno Mwanafunzi, Nitin Jain</i>	14
Before Investors Can Wet Their Feet: The Complex Preparation for Greenfield Hydropower Public-Private Partnership Transactions - <i>Nicola Saporiti</i>	20
Promoting Sanitation Markets at the Bottom of the Pyramid in Peru: A Win-Win-Win for Government, the Private Sector, and Communities <i>Malva Rosa Baskovich</i>	26
Taking a Stake in Emerging-Markets Water Companies <i>Patrick Mullen, David Tinel, Alice Laidlaw, Muguel Toledo, Francesca McCann</i>	32
Private Operators and Rural Water Supplies: Can It Work? <i>Elizabeth Kleemeier</i>	36
First-Ever Successful Public-Private Partnership in Egypt! New Cairo Wastewater Treatment Plant - <i>Muneer Ferozie, Aurélien Boyer, Malak Draz</i>	42
Helping Small Water Utilities Become Bankable <i>Leila Elvas</i>	48
Redesigning a Program from the Ground Up <i>Frances Gadzekpo</i>	54
Dealing with Informality in Water Supply Services in Indonesia <i>Deviariandy Setiawan</i>	60
Water Footprint: A Tool for Unleashing Corporate Water Stewardship <i>Sabrina Birner, Remke van Zadelhoff, Bastiaan Mohrmann</i>	66

Using Market Finance to Extend Water Supply Services in Peri-Urban and Rural Kenya

Given the immense pressure on government and donor resources to achieve the Millennium Development Goals, access to finance for infrastructure investment is critical. This SmartLesson explains how donor funds are used to leverage domestic market finance and equity for investment in small piped water infrastructure in the peri-urban and rural areas of Kenya. It also illustrates how leveraging donor funds not only increases the volume of investments financed but also improves the sustainability of these investments by linking debt service to system functionality.

BACKGROUND

In Kenya, community-based organizations (CBOs) are important providers of water supply services in peri-urban and rural areas that are not served by publicly owned utilities. CBOs operate some 1,200 small piped water systems throughout the country, serving 3.7 million people. However, much of the infrastructure in these facilities is rundown as a result of years of underinvestment in maintenance. Leaking distribution and storage infrastructure and inadequate water sources are common problems with these systems. But the demand for rehabilitation and expansion is significant, especially considering that the price of alternative sources of water supplied by vendors is much higher than that sold through piped systems.

Access to finance for infrastructure investment in community-run piped water systems remains a considerable constraint, because government and donor resources are mostly channeled into public utilities and areas inhabited predominantly by the very poor. To address the demand for infrastructure finance, an innovative program that blends commercial debt with subsidies to finance investments in community

water projects (CWPs) was initiated in the Athi Water Services Board service area of central Kenya in 2006.

Under this program, CBOs can borrow up to 80 percent of the cost of infrastructure rehabilitation and development from K-Rep Bank, a Kenyan commercial bank specializing in microfinance lending. The remaining 20 percent of the project cost is financed by equity from the CBOs. The typical value of investments ranges from \$75,000 to \$170,000. On completion of project implementation, up to 40 percent of the total project cost is paid to the CBO as a subsidy. The subsidy is provided by the Global Partnership on Output-Based Aid, and the Water and Sanitation Program-Africa (WSP-Af) provides advisory services and supervises the program. The subsidy is paid against predetermined output targets set at the time of taking the loan. These targets are measured as follows:

- **Coverage:** Increase in the number of active water connections served by the project
- **Revenue:** Increase in average monthly revenue realized by the project



Small community-based water providers in Kenya can access the finance they need to improve water systems and connect poor households to piped water supply through K-Rep Bank.

To cover the lender's exposure during project implementation, K-Rep Bank purchased a partial credit guarantee from the United States Agency for International Development's Development Credit Authority, payable if the subsidy is not awarded to the borrower. If projects do not achieve the entire output target, the subsidy is paid against the percentage to which output targets are met. The creditworthiness of the CBOs applying for loans is assessed according to K-Rep's internal risk criteria. To borrow, a CBO must be formally registered as a cooperative or society and must secure the legal right to sell water within its demarcated area of operation, which is essential for giving the lender the necessary comfort to lend to the CBO.

In Kenya, the right to supply water is granted by one of the eight regional Water Services Boards (WSBs) that provide a CBO with a service provision agreement (SPA). The SPA is a management contract that assigns the water services operating mandate

to the water services provider, giving it a monopoly over the supply of water within its area of operation. The SPA defines the operational and performance characteristics between the two parties and is subject to regulatory oversight.

Since the program's inception in 2007, K-Rep Bank has lent \$1 million to 12 CBOs, 9 of which have completed implementation of their projects and have received subsidies. The investments financed include water resource development and augmentation, water treatment, distribution, and meters. These investments are expected to increase the number of connections in the projects financed from 5,300 to 9,900 and target about 67,000 beneficiaries. The program is now being scaled up to target 50 projects countrywide, targeting 165,000 beneficiaries; the disbursement rate is expected to increase significantly, because the implementing agency has come some way down the project management learning curve.

LESSONS LEARNED

Lesson 1: The lender should have in-house credit appraisal skills typically used in project finance and should be prepared to lend to projects without tangible collateral, because borrowers generally do not have a financial track record or assets that support balance sheet lending.

The lender needs to blend the capacity to work with community groups with the sophisticated credit analysis and monitoring skills used in project finance. Adequate capacity is required to appraise a CWP's ability to meet its operating and finance costs from future water sales. This requires an understanding of water utility operations, cost and tariff structures, water supply capacity and constraints, and the nature of demand for paid water. Because the principal collateral that a borrower can offer is its cash flow from water sales that will be generated from the investments financed by the lender, the credit analysis must establish financial viability from this perspective. The borrower's exclusive right to supply water to customers within the project area provides collateral by way of the lender's being able to require a change in management to secure debt service payments in the event of default.

In this program, the lender built its in-house credit appraisal capacity by putting together a project appraisal team led by an experienced water engineer who works closely with the specialized project development and implementation consultants employed under the program. These activities are aimed at obtaining project-specific technical and financial data to inform the lending decision. Training and support in developing project appraisal tools and in marketing the loan product have been provided by WSP-Af, which initially identified K-Rep Bank as an implementing partner that was eager to support this innovative financing concept. A key factor in K-Rep's decision to implement the program is that CBOs are an important part of the bank's customer base.



Investing in community water projects can be viable for commercial banks. Following a successful pilot, the program in Kenya is being expanded to target 165,000 beneficiaries.

Lesson 2: It must be evident that the consumers served by the CBO are able and willing to pay for water, because their payment drives the cash flows needed to repay the loan.

Although the program targets communities that are relatively poor, consumers in projects borrowing under the program pay an average monthly water bill of \$10 to \$25, depending on system operating and debt service costs. A CWP must also have sufficient scale to generate the necessary revenue to meet costs. A typical project financed under the program has 350–600 individual connections, and tariffs vary from \$0.50 to \$1.00 per cubic meter. Poorer residents who cannot afford individual connections benefit by being able to purchase water—from point water sources installed by these projects—at lower rates than those prevailing in the area prior to the project.

For example, Kiamumbi Water Project, a typical project financed under the program, draws water from a dam built by a farmers' cooperative society in the 1970s for irrigation. As farmers switched to more intensive dairy farming and subdivided the land for residential use, there was less demand for irrigation

water. On the other hand, growing population pressure increased the demand for water for domestic consumption and introduced the idea of using the dam to supply households with water. At the time, residents obtained water for domestic and livestock use from vendors and shallow wells. The community borrowed \$135,000 from K-Rep Bank to finance a system that would supply potable water to 750 households. The project was completed in August 2009, and the community contracted with a private operator to run its system on a five-year management contract. The project generates monthly revenues of \$7,500 from the sale of 9,000 cubic meters of water to 450 individual connections and a water kiosk, at an average tariff of \$0.81 per cubic meter. The CBO makes timely debt service payments of \$1,750 to K-Rep Bank every month, after having received a

subsidy of \$80,000 that went toward reducing its outstanding debt at the end of the construction phase.

In appraising the financial viability of a project, the lender must be able to establish that consumers in the project area can afford to pay monthly water bills and that demand for water from the project area is not eroded by competing sources of water supply. CWP's financed under the program must be able to generate enough cash from water sales to cover operating costs and complete their debt service payments within the maximum loan repayment period of five years.

Lesson 3: It is critical to have a pool of capable companies providing business development services to support CBOs financed under the program. Projects should be pooled to enhance their attractiveness to a specialized



The community-based water service providers develop, own, and manage the water assets.

operator, and qualified operators should be encouraged to undertake design-build-operate contracts.

Experience from the pilot project suggests that communities lack the skills and experience needed to implement and manage water projects efficiently. To build a pipeline of viable projects that could be financed by K-Rep, IFC Advisory Services in Public-Private Partnerships provided a grant to fund the development of bankable loan applications to be appraised by the lender, while WSP-Af provided technical assistance to improve the quality of loan applications. The loan applications are developed by consultants that implement and manage the projects for the term of the loan to pass the risk from the communities to private sector companies that specialize in the development and management of water supply systems. These companies can provide much-needed expertise during a period when most projects will experience significant cash stress on account of debt service payments. The program has short-listed three companies to provide support to CWP's under the program, and has undertaken various training activities to build the capacity of these firms. The lender oversees procurement of consulting and management services and is a counterparty to the contracts signed between companies providing support and the CBOs, because the communities require support in contract management.

After paying for direct operating expenses and debt service, individual CWP's financed under the pilot do not appear to generate sufficient free cash to be able to contract with a private operator to manage their systems during the loan repayment phase. Under existing operator contracts, there have also been problems with meeting the operator fee, because control of the cash from water sales rests with the CBO.

To improve the financial viability of CWP's, the projects should be clustered, and specialized operators should be assigned to design, build, and then operate the systems on concession-type contracts for the duration of the construction and loan repayment

period. To bring economies of scale and scope to individual CWP's, each operator needs to manage a number of projects in geographical proximity, while ensuring that there are enough operators in the program to promote competition. This also provides the necessary motivation for an operator to invest resources into making the construction and management of small piped water systems a viable business. A design-build-operate contract inherently contains an incentive for an operator to ensure that the systems built are functional for the term of the five-year loan, thereby improving their sustainability. Given that transferring risk from the CBO to the specialized operator will reduce risk to the lender, the program may also want to consider financing the operator rather than the CBO.

Lesson 4: Disbursing subsidy funds on a pari passu basis with commercial debt results in significant cost savings; paying the subsidy on project completion increases overall project costs significantly.

Under the current program structure, disbursing subsidy funds at the end of the construction phase increases the total project cost by 12–18 percent because of interest costs, and it increases the risk of default if construction cannot be completed within one year. Although the objective of the output-based subsidy is to ensure that specific project objectives are met before subsidies are paid, the lender's rigorous disbursement processes bring a level of oversight not typically found in government- or donor-funded projects. This oversight ensures that loan disbursements are directly linked to achieving project objectives and could therefore act as output targets under the output-based subsidy approach to reduce project costs and the risk of default. This would provide additional comfort to the lender and remove the need for the lender to have a credit guarantee to cover construction risk, thereby further reducing finance costs. Programs considering a similar approach should therefore consider structuring outputs to mitigate risk to the lender and reduce project costs.

CONCLUSION

The program has shown that subsidies can be leveraged by two-and-one-half times to secure cofinancing from the private microfinance sector as a way to expand water supply infrastructure in peri-urban and rural areas. The operational life of systems financed under this approach is likely to be significantly greater than that of systems financed with government or donor grants, because in securing its interest the commercial bank provides a level of oversight to management that is not typically found in projects financed with grants and soft loans.

Programs targeting similar approaches should scope the market to ensure that there is a sufficient pipeline of financially viable and technically feasible projects to warrant the establishment of a leveraging mechanism, and that the legal framework offers the necessary protection to secure the interest of commercial lenders. Further consideration needs to be given to institutionalizing the support mechanisms needed to develop the project pipeline, especially if the program is to achieve sufficient scale. Critically, funds for advisory assistance, grants, and infrastructure subsidies under this program have been provided by World Bank Group organizations. If government grants are to be leveraged in a similar fashion, it is crucial that an institutional framework that supports the development of a pipeline of financially viable projects be established to facilitate private sector bank lending to water projects. Any such framework must recognize the fact that a commercial bank will conduct an internal credit risk assessment of every project it intends to finance.

ABOUT THE AUTHOR

Rajesh Advani is a Finance Specialist with the Water and Sanitation Program. Rajesh is based in Nairobi, Kenya, where he manages the program and works on other projects to improve utility access to market finance in Africa.

Approved by Wambui Gichuri, Regional Team Leader, Water and Sanitation Program, Africa.

Thinking Outside the Pipeline: Venturing into Distributed Off-Grid Water Markets

Traditionally, IFC's engagement in the water sector has focused on large municipal infrastructure projects, where individual transactions are of sufficient scale to attract commercial project finance. Such projects, involving capital-intensive network infrastructure, can often be commercially attractive but have generally failed to provide access to poorer consumers living outside of formal urban centers. So what about the "base of the pyramid" populations that those large utility systems fail to reach—rural communities, and sometimes poorer urban customers living within informal settlements and rapidly growing peri-urban areas? New business models are needed, adapted to the reality of water-supply necessities in the developing world, but with the economies of scale required to achieve financial sustainability. This SmartLesson describes some early ventures by IFC to invest in and develop market opportunities in the challenging but potentially far-reaching area of distributed off-grid water supplies.

BACKGROUND

How do you increase access to water for the hundreds of millions of consumers living outside of large formal urban centers? This question has long been considered a concern of the public sector, to be dealt with by governments and subsidized by donor and nongovernmental organization (NGO) programs. However, despite huge investment and effort—registered aid to Sub-Saharan Africa alone for water and sanitation is close to \$3 billion per year¹—sustaining increased access to clean water remains a challenge. And even where public investments have succeeded in putting in place the necessary infrastructure, the technical capacity and cost-recovery mechanisms required for long-term sustainability of operations are often lacking. The prospect of greater water scarcity, due to population growth and climate pressures, compounds this challenge.

¹ African Ministers' Council on Water (AMCOW), September 2010, Country Status Overview on Water and Sanitation.

IFC has been seeking new ways to harness the innovation, technical skills, and financing of the private sector to provide affordable and sustainable water supply services to the "bottom billion" at the base of the pyramid who currently lack access to clean drinking water.² One such opportunity is in the area of off-grid, distributed services (or "micro-utilities"), an approach to delivery of basic services, such as power and water, to rural communities across the developing world through small-scale, decentralized facilities. The economic driver behind this approach is the lowering of capital costs as a result of reduced grid-connection infrastructure (pipes and transmission cables), thus increasing the potential for financial sustainability, even for utilities serving small populations. IFC estimated the size of the global distributed water market to be about \$114 billion as of 2005 (including packaged water and purification equipment and related services).

² According to the WHO/UNICEF Joint Monitoring Program for Water Supply and Sanitation (2010), about 900 million people lack access to any improved source of drinking water.

This concept of distributed services is not new; throughout the world, water has long been supplied via decentralized systems, from the level of basic village wells upward. What is new is the recent emergence and growth of such models in market-based form. In 2004, a shining example of such innovation came in the shape of WaterHealth International (WHI) in India. (See Box 1.)

The demonstration effect provided by the investment in WHI has provided a further impetus for IFC to think more systematically about the range of potential market opportunities in the water-supply sector. (See Box 2.) In 2009, the Sustainable Business Advisory business line published a report, *Safe Water for All: Harnessing the Private Sector to Reach the Underserved*, which provided an in-depth look at the barriers to greater private sector delivery of water and sanitation products and services to consumers at the base of the pyramid. This study, in turn, has triggered the development of a Sanitation and Safe Water for All (SSAWA) program to support market-

Box 1: The WaterHealth International Model

WHI is a private company that installs, operates, and maintains WaterHealth Centres (WHCs) in villages and peri-urban areas in India and Ghana. WHCs have the capacity to purify large volumes of water, sourced locally, to provide safe water to communities of several thousand residents. The local community is responsible for providing land, access to a perennial water source, and in some cases a percentage of the down payment for the installation cost (which is generally in turn sourced through donor support).

Under this model, WHI can provide reliable access to treated drinking water at prices as low as \$0.20 for 20 liters. The faith shown by IFC in the company through an early-stage equity investment of \$1.2 million in 2004 has paid off, catalyzing over \$29 million in external equity financing, a \$15 million loan investment in 2009, and a follow-on \$5 million equity investment in 2010 from IFC's Infrastructure Department.



A water dispensing station in Nagaram, Andhra Pradesh, India. WaterHealth International, an Acumen Fund investee, worked with Naandi Foundation to set up water purification plants in villages across Andhra Pradesh. Branded as Dr. Water, the plants provide rural access to clean, safe, and affordable water in a financially sustainable manner.

based approaches with the potential to expand access to water and sanitation services for lower-income consumers. The program, developed under Sustainable Business Advisory, Africa, began in Kenya in October 2010. It is exploring the potential of a range of market-based approaches, including in distributed off-grid markets such as vended-water kiosks, private operation of micro-piped community systems, and private provision of sanitation services.³ The program supports the development of scalable business models in these markets with the potential to achieve significant scale.

LESSONS LEARNED

The lessons below are based on experience gained from the WHI investment and on the early knowledge generated from the establishment of the SSAWA program in Kenya.

Lesson 1: Some form of aggregation is key to commercial viability and scalability.

In the case of large municipal water-delivery networks, high fixed costs mean that profit margins are closely tied to volumes of water billed. For small, decentralized systems, opportunities for increasing volumes are limited, while fixed operating costs (primarily labor) will be high. So the challenge is that individual operating or management contracts are often too small to attract private interest. Only via some form of aggregation can the model be financially sustainable, and therefore scalable.

Aggregation can be achieved in different ways. WHI, for instance, aggregates operating costs across systems, thereby reducing marginal costs of new installations. Technicians, for example, will be much more cost-effective servicing several locations rather than one. “Scaling across” provides the economies of scale and volume needed to make the business model work.

³ Experiences from Kenya described here are primarily based on market research conducted in the process of designing the SSAWA program.

Box 2: The Operational Value of Private Sector Management in Water

Doing business in water supply is not easy. Returns in regulated markets—in which most utilities operate—are low, and in the water sector they can be restrictively low, especially in developing countries, where customers face financial constraints. In such an environment, efficiency is critical, and success depends on economies of scale, both in volume and in operations.

It is therefore not surprising that a major constraint facing small-scale water-supply systems in the developing world is the capacity of the operators to sustain service quality. In Kenya, for example, an estimated 40 percent of rural water systems are nonfunctional, consistent with figures elsewhere in Africa. Such systems can fail for financial or technical reasons, the latter often due to a shortage of technical skills or simply a lack of spare parts needed to sustain operations. The World Bank estimates lost investment due to nonfunctional systems in Sub-Saharan Africa at about \$1.25 billion over the past 20 years.

Private sector participation has proved to be one potential means to overcome such constraints. For example, in the case of WHI, supply chain management and technical skills are “internalized” within the company, providing built-in operational capacity for any WHC for the length of the contract period (usually at least 10 years). Quality assurance is also motivated by the need to maintain brand quality and avoid reputational risks, while the profit incentive drives an emphasis on “counting the pennies” by pushing volumes and reducing costs at the same time.

In Kenya, the SSAWA project is designed to support businesses looking to develop similar scalable models with the potential to reach base-of-the-pyramid consumers. One approach being explored in the vended-water market is the franchising of purified-water kiosks



Children with Dr. Water cans in Nagaram, Andhra Pradesh, India. WaterHealth International, an Acumen Fund investee, worked with Naandi Foundation to set up water purification plants in villages across Andhra Pradesh. Branded as Dr. Water, the plants provide rural access to clean, safe, and affordable water in a financially sustainable manner.

to individual entrepreneurs, managed by a centralized operating business with existing expertise in water purification systems. Such approaches have achieved scale in Southeast Asian markets, and early research suggests that a similar opportunity may exist in Kenya.

Aggregation does not necessarily entail standardization, and the interests of the private sector are well suited to adapting business models to local demands. For example, in Kenya, as in many water-scarce countries, water for drinking is often just one of many sources of demand that can be tapped to reach the volumes needed to recover costs. Companies testing the market have found that demand for water for micro-irrigation and

for livestock can make the economics of decentralized water systems viable in some locations where demand for drinking water alone is insufficient. In these cases, the viability of the business model will depend on whether the additional volumes offset the cost of the micro-piped systems needed to distribute supply.

Lesson 2: Commercial finance can increase the reach of scarce public funds, while public funds can be a catalyst to scale up commercial approaches.

Investments in the water-supply sector often need a certain level of capital subsidy built into the funding structure. This frequently translates into overdependence

on subsidies, which undermines the potential scalability of a business model and restricts a key benefit of private sector participation: the ability to raise commercial finance and equity.

Private sector participation in distributed services can offer flexibility in the blending of public and market finance, thereby maximizing the reach of scarce public resources. Different mechanisms are available to achieve this. For example, WHI is exploring an approach whereby the subsidy is tiered according to village size, with larger villages requiring lower subsidy levels than small ones. In another approach, the government uses a competitive bidding process to determine levels of subsidy needed for a cluster of water-supply systems. Conversely, if an installation in a particular higher-income or densely populated area can be fully commercially financed, then the private sector can proceed on a purely market-financed basis, allowing public funds to go where they are needed most.

Take for example one promising market opportunity identified in the sanitation sector in Kenya. A local company, Ecotact, has pioneered a distributed service model for pay-per-use urban sanitation facilities marketed under the IkoToilet brand. Ecotact started out in selected high-traffic parts of Nairobi, where individual facilities were profitable—thanks to high customer volumes and innovative revenue streams such as external advertising and cross-sales of other products. With the visibility of the brand built and economies of scale established, the company is becoming creative in developing partnerships with the government and donors to expand facilities into schools and urban slums through blended public-private funding, thereby growing the business and increasing access to much-needed services.

Lesson 3: Maintaining focus on comparative advantage and building strategic partnerships can be the difference between success and failure.

Where subsidies are necessary, the difference between success and failure frequently rests on the ability to be creative in developing partnerships. WHI achieved its current scale, for instance, in large part due to an extensive range of partnerships with development agencies, foundations, NGOs, and wealthy philanthropists. The key is to identify and leverage the added value of each partner—and potential win-wins that often go beyond financial support. For example, in partnerships with health-promotion NGOs, WHI benefits from increased demand generated by the NGO's safe-water education campaigns, and the NGO benefits from linking its education work to new and reliable clean-water supplies.

While developing partnerships, the importance of specialization cannot be overstated. Under the WHI model, donors provide invaluable financial support, visibility, and oversight; NGOs provide crucial education and awareness raising (a critical ingredient for early adoption of services such as safe water); and the private company sets up and operates the system. Moving activities and responsibilities from one partner to another can arguably compromise the health of the overall operation. For example, an NGO that is effective at raising donor funding may be tempted to set up and operate water supply systems within the communities it interacts with. It may be able to do so at competitive costs initially, but it is less likely than a private operator to have the incentives in place to sustainably run such operations for long periods. In contrast, a private organization will build operation and maintenance costs into the price of the service. And any impact on up-front costs is likely to be offset by the benefits of sustainable long-term, high-quality services.

Other examples point to the value of partnering with local financial intermediaries to achieve scale. In Kenya,

for instance, the World Bank Water and Sanitation Program has helped establish a partnership between the local K-Rep Bank, the Global Partnership on Output-Based Aid, and local communities, to blend 40 percent market financing into small piped-water systems. In such cases, the local bank has the potential to act as a powerful “scale multiplier,” given its strong comparative advantages in identifying and appraising commercially viable business plans, and the incentives to reduce marginal costs by expanding project pipelines.

CONCLUSION

Scaling up off-grid, distributed water supply models via market financing and private sector operation will not come easily. This high-volume, low-margin business needs significant investment in operational infrastructure, plus management structures geared to meet the needs of rural retail environments. It is also a fragmented market, where the key to success lies in the ability to achieve scale through aggregation of some form. However, the prize is significant, because scalable distributed service models, operated and managed by the private sector, may ultimately prove to offer one of the most capital-efficient means for developing countries to accelerate increased access to safe water.

Through investments in companies such as WHI and advisory services projects such as SSAWA, IFC is playing both a practical and a thought leadership role in the development of new market opportunities in the water and sanitation sector. Indeed, a key objective of the SSAWA program in Kenya will be to encourage market development in this space and to identify and support the demonstration of more WHI-like business models. It is hoped that this will bring together investment and advisory services in catalyzing market solutions to the challenge of providing access to water and sanitation services for consumers at the base of the pyramid. We hope this SmartLesson is just a first installment in IFC’s emerging ventures into distributed off-grid water markets.

ABOUT THE AUTHORS

Vikram Kumar, part of the IFC Infrastructure Team in Nairobi since February 2009, joined IFC in December 2006 as an Investment Officer based in New Delhi and covering India, Nepal, Bhutan, Sri Lanka, and the Maldives. Prior to that, Vikram held positions as a corporate investment banker for ICICI Bank and YES Bank in India, and credit officer with Bank of America in India and the United Kingdom.

Will Davies joined IFC in Nairobi in January 2010 to set up the SSAWA program. For four years prior to that, he worked on the economics of water in East Africa, including as an economic advisor to the Ethiopia Ministry of Water Resources and as a consultant for the Water and Sanitation Program of the World Bank.

Approved by Usha Rao-Monari, Global Head, Water; Khetsiwe Dlamini, Business Line Leader, Africa Sustainable Business Advisory.

Improving Rural Water Service in Rwanda with Public-Private Partnerships

In 2004, a field review commissioned by the World Bank found that half of the piped rural water supply systems in Rwanda were nonfunctional due to poor management and poor cost recovery. In response, the government shifted to a public-private partnership (PPP) management model. As of 2010, 235 rural water supply systems—28 percent of the 847 systems in the country—are managed under PPPs, serving 1 million people. This SmartLesson shares what the World Bank-administered Water and Sanitation Program (WSP) learned in support of Rwanda’s remarkable progress, including using best practices to make the case for reform; fostering ownership, simplicity, and flexibility of design; using peer-to-peer learning; and evaluating factors for success.

BACKGROUND

In the 1990s, the rural water supply and sanitation (RWSS) sector in Rwanda faced many challenges stemming from top-down programming of investments, high per capita investment costs for system construction, poor cost recovery, and low sustainability. Furthermore, the sector’s infrastructure suffered from considerable destruction during the period of civil war and the 1994 genocide. Demands of postwar reconstruction placed immediate emergency relief ahead of longer-term sustainability considerations.

In 1998, the government of Rwanda embarked on a decentralized, participatory approach to development to ensure participation of the local population in the decision-making process to foster reconstruction, reconciliation, and community reintegration. At the same time, the rural water supply sector developed a new strategy based on four key elements: 1) formulating a demand-responsive approach through which communities could choose a preferred service level based on their willingness to pay, contribute to a portion of investment costs, and pay in full the

operation and maintenance costs of their facilities; 2) decentralizing planning and management of services at the district level; 3) supporting the private sector as the provider of all works, goods, and services; and 4) redeploying the public sector as facilitator, with the Ministry of Water providing assistance and support to the district authorities and water users associations.

The World Bank has supported the government of Rwanda’s rural water supply sector strategy through a combination of loans with a sector investment RWSS project¹ and a series of development policy lending operations with a poverty reduction support credit/grant from 2004 onward, comprising specific policy measures to support rural water and sanitation sector reforms. (See the box.) The WSP has provided technical assistance to support donor coordination and capacity building for private operators from 2006 onward.

¹ RWSS Project, \$20 million (2001–2007).

Fixing Targets Stimulated Actions and Results

A series of poverty reduction strategy grants (PRSGs) supported the government of Rwanda's PPP policy in the rural water sector, through policy dialogue and policy measures, including prior actions. The prior action of the second PRSG supported the Ministry of Water in developing guidelines to assist districts in contracting with private operators and to have at least one contract signed in each of the four pilot provinces by September 2005. The prior action of the third PRSG was to have 10 percent of rural water systems managed by local private operators by September 2006. The fourth PRSG included a target of 20 percent of rural water systems managed by local private operators by November 2007. All three policy measures were achieved.

Since then, the rural water sector has made outstanding progress and successfully scaled up investment and reforms. Rwanda is on track to achieve the Millennium Development Goal of providing 85 percent of the population with access to potable water and 66 percent with access to hygienic sanitation by 2015. It has increased access to potable water from 40 percent of the population in 2002 to 74 percent in 2009. The number of functioning rural water supply systems has also increased from 50 percent in 2004 to 85 percent in 2009. These results were achieved by effectively moving the sector from a projects approach to a sectorwide approach, led by the government, with the elaboration of a medium-term expenditure framework,² enhanced donor coordination, sector expenditure reviews, and an annual sector review with the participation of all stakeholders. Rwanda also implemented a successful decentralized approach to service delivery, with the districts fully in charge. Sector service delivery capacity has improved, with an additional 600,000 people getting improved water service each year since 2005, against fewer than 60,000 in 2002. Sector expenditures have increased tenfold to \$32 million from 2006 onward, with a continual increase in both domestic funding and fiscal transfer to the districts.

2 A medium-term expenditure framework is annual, rolling three year-expenditure planning, which sets out the medium-term expenditure priorities and hard budget constraints against which sector plans can be developed and refined. It also contains outputs and outcome criteria for the purpose of performance monitoring.

The introduction of PPPs to improve the operations of piped rural water supply systems has been an unprecedented success. As of June 2010, 65 PPP contracts had been signed for 235 public systems serving about 1 million people. The systems under PPP contract serve an average of 5,000 people, and a few systems serve more than 100,000 people. The network length varies from 6.5 kilometers to 491.0 kilometers. About 80 percent of these systems are gravity-fed systems, and 20 percent are pumping systems. Ninety-five percent of the people are served by public stand posts, and 5 percent have a household connection. Moreover, 64 systems are owned and managed by private institutions, including parishes, monasteries, hospitals, and factories, which serve about 100,000 people.

LESSONS LEARNED

Lesson 1: Use best practices and analytical work to make the case.

Tailoring the PPP approach to rural water supply systems was not initially part of the government's or the World Bank's strategy. The initial approach was clearly to have community-based organizations manage their systems. The idea grew from a field visit in 2003, when the project team had the opportunity to visit three districts³ in the province of Byumba (now part of the North Province). The districts in

3 The districts of Rebero, Mulindi, and Bungwe.

Byumba had decided to tap into the financial and technical capacity of the private sector by contracting out the operation and maintenance of their water supply schemes to local private operators. The field visit marked a turning point in the way piped water supply systems would be managed in Rwanda. Private sector participation seemed a remote possibility, but these districts had already done it.

In 2004, the World Bank RWSS project conducted field reviews of community management in the country and of the experience with private operators in the three districts of Byumba Province. The findings were discussed at the medium-term review of the World Bank project in May 2004. The review found that, for the community-managed systems, about 50 percent of the piped systems were nonfunctional due to the absence of performance incentives (volunteer status), the users' unwillingness to pay, mismanagement of funds, and technical weaknesses. Conversely, local private operators, which were placed in challenging situations (some of them were managing costly pumping systems) had overcome these issues and were even able to self-finance system rehabilitation. The World Bank agreed on an action plan aimed at testing and supporting a wider PPP approach for the operation of water facilities.

A few weeks later, Minister of Water Munyanganizi Bikoro visited the three districts of Byumba to learn about the private sector approach and to determine whether to make this a national program. At that time, about 50 percent of the sector investment budget was dedicated to rehabilitation works. The systems in Byumba highlighted the potential of using private sector participation to help make public expenditures more efficient (by reducing the burden of maintenance and rehabilitation costs) and to expand services to more people. As is typical in Rwanda, once a decision was made, implementation followed.

Lesson 2: Promote ownership, simplicity, and flexibility in the design.

Despite recognizing some weaknesses and risks in the approaches developed by the three districts of Byumba Province, the Ministry of Water decided to use them as the basic model. These privately run systems were better managed than the community-based systems. People now had access to reliable services⁴ at an affordable price,⁵ and districts were receiving a substantial fee from the operators to add to their budget. The decision to use the experience of these districts to move to scale was critical in the development of PPPs in supplying rural water in Rwanda, because people accepted it as a locally developed approach that could be implemented locally.

Each district developed contracts with very simple terms for potential operators, with a minimum set of qualifications based on the contracts used by Byumba Province. Given the limited experience of operators and the districts, the contracts were a cross between management contracts, where the operators are responsible only for the water supply operation, and lease contracts, where the operators have to assume some investment and commercial risks for the systems they manage. The length of contracts was quite short in comparison to conventional international standards, but this was a necessary compromise, given the lack of data and the uncertainty of demand and willingness to pay in the market.

The selection criteria for the operator generally took into account the price of water, the fee paid by the operator to the district, and the quality and reliability

⁴ The impact study and the operators' reports showed that water users are consuming 8.5 liters per capita per day at the spring catchments and 13.0 at the stand posts of the gravity-fed piped systems. Users with private connections consume 20 liters per capita per day.

⁵ The water rates range from FRW 2.5 (gravity-fed systems) to FRW 15 (pumping systems) per container of 20 liters (equivalent to \$0.25 to \$1.40 per cubic meter). Users with private connections pay FRW 185 to FRW 600 per cubic meter. The districts keep a list of vulnerable households (widows, poor single-parent households), who get free access to water points.



Woman fetching potable water at a stand post.

of the technical proposal. The Rwanda Utilities Regulatory Agency endorsed this approach because of the diverse local contexts and the uncertainty of demand for services.

Although most of the operators did not have specific experience in managing water supply services, they all had an entrepreneurial spirit supported by basic business acumen. Their diverse backgrounds included former civil servants, local businessmen, small cooperatives, and informal associations of local residents. One-third of the operators were women.

The selection criteria had to be flexible in such a nascent market, and it was not a process that could occur overnight. As the PPPs have gained momentum in Rwanda and more market information has become available, more robust private operators have entered the business, and the contracting and oversight processes have evolved and are more sophisticated.

Lesson 3: Use peer-to-peer learning to disseminate knowledge and lessons.

Although decentralization brought new opportunities, it also came with significant challenges due to lack of technical capacity of local governments and local

service providers. The project helped bridge these gaps by adopting a peer-to-peer learning approach to disseminate the concept of PPPs. We also took a learning-by-doing approach to improving contracting process and management practices.

The project made possible 10 exposure visits to Byumba for about 75 district representatives during 2004 and 2005. It also organized one national workshop in 2004 and several regional training workshops in 2005 and 2006 to exchange early PPP experiences. Participants included districts, private operators, nongovernmental organizations, and regulatory agency and donor representatives. The rule was that only people who had been active in implementing the PPPs in Rwanda would become the trainers. No external consultants have been involved. This approach helped the government gain buy-in from all the sector stakeholders.

Lesson 4: An enabling environment determines the feasibility and likelihood of success for PPPs.

In Rwanda, the enabling environment was definitely favorable for improving rural water operations. The government was committed to reform and willing to lead the processes of change. The legal environment was favorable toward private sector participation in the delivery of water services; the Water Law allowed various options for managing a rural water supply service, either through municipal management or delegation to a water users association or a private operator. The rural residents were already accustomed to paying for operation and maintenance costs for improved water sources. The decentralization policy, which allocated full responsibility in infrastructure planning and service delivery and financial and human resources⁶ to the district, established an adequate framework

⁶ Thirty percent of budget expenditures are decentralized from national level to district level, and the civil service reform allowed redeployment of central-government staff to the districts.

Water treatment plant.



and the legitimacy of the district authorities to shift the management of water facilities to PPPs.

CONCLUSION

Although the operational record of the PPPs is relatively short, because most of the contracts were signed in 2006–2007, the experience of the first contracts has been positive. Operators and the districts have been able to overcome unforeseen problems and to adjust the contract terms as needed, with some external support. Recent assessment of the rural water PPPs⁷ that have been implemented revealed that the majority of the customers interviewed said they were satisfied with the service provided and the quality of water distributed. However, a number of issues still need to be addressed, such as the regulatory oversight of PPP arrangements, including selection criteria, contract management, compliance monitoring, accounting practices, and tariffs.

A key issue for the success of the PPPs is to ensure financial viability by setting appropriate tariffs and regulating the amount and usage of the fees collected by the districts. Viable water tariffs in rural areas tend to be relatively high, particularly in pumped systems, which poses a challenge for rural households and encourages the use of alternative, unsafe sources of water supply. Options to achieve cost recovery while keeping tariffs affordable include professionalizing service management, selecting appropriate technologies, grouping individual schemes, and targeting subsidies.

Furthermore, the government needs to focus on ensuring the sustainability, reliability, and affordability of these services and on the wider issues of managing and protecting scarce water resources. Evidence from developed and developing countries shows that it is not so much a question of who manages the services,

but of how the service and the assets are managed and how long the service provider is technically and financially supported.

ABOUT THE AUTHORS

Christophe Prevost is a Senior Water and Sanitation Specialist with the Water and Sanitation Program and is based in Delhi. Christophe has managed rural water supply projects in Rwanda and Madagascar and has participated in 15 development policy lending operations to lead the policy dialogue on rural water supply and sanitation reforms.

Bruno Mwanafunzi is the Water and Sanitation Program Country Coordinator for Rwanda. Prior to working at the Bank, Bruno was the director of the Directorate of Water and Sanitation in the Ministry of Land, Environment, Forestry, Water, and Mines in Kigali, Rwanda.

Nitin Jain joined the WSP's Strategy and Operations team in Washington in 2007 and currently supports the monitoring component of WSP's Domestic Private Sector Participation program in Rwanda. Prior to working at the Bank, Nitin was a consultant with KPMG's Energy and Utilities Advisory Services.

Approved by Jae So, Manager, Water and Sanitation Program.

⁷ "Rwanda-Analysis of the delegated management of rural water supply system." 2009. *Hydroconseil & GeoTop- Final Report 2009*.

Before Investors Can Wet Their Feet: Complex Preparation for Greenfield Hydropower Public-Private Partnership Transactions

Use of water resources for hydropower generation is, once again, a potentially attractive tool for economic development. Until a few years ago—with some notable exceptions—the low prices of fossil fuels, the efficiency of gas-powered plants, and strong environmental opposition had sidelined the hydropower sector from the wave of private sector investment in independent power generation. But now, increasing concerns about carbon emissions from fossil-fueled power plants, climate change, and rising oil prices make hydropower more appealing. The challenges that need to be carefully considered before entering into any advisory or financing arrangements are: how to facilitate private sector investment in this sector, and how to implement hydropower public-private partnership (PPP) transactions. This SmartLesson presents and analyzes some of the key lessons that have emerged during several hydropower PPP projects.

BACKGROUND

Thermal power plants (TPPs) burn fossil fuels (a nonrenewable energy source), yet they usually face limited local opposition on environmental grounds: a country that increases its greenhouse gas emissions through the development of a new TPP expects to derive disproportionate economic benefits while bearing a relatively small share of the negative environmental impact caused by its emissions. On the other hand, the development of new hydroelectric power plants (HPPs), a renewable resource, usually faces major local opposition, because a country that develops a new HPP can expect to bear all of the negative environmental impacts while deriving only a fraction of the benefits associated with greenhouse gas emission reductions (typically through the sale of carbon credits).

Reservoirs are often designed to provide important local benefits to society (for example, through decreased risk of flooding or improved availability of water for

irrigation). Yet the development of a new HPP often faces major local opposition, because opponents associate it with the following negative impacts:

- Loss of access to water (a common good) for local communities, because water flow is altered and water is piped and released only after it flows through the turbines
- Loss of land that is prized for its biodiversity, particularly wetlands, due to flooding of the reservoir
- Economic and physical displacement of people
- Transformation of the landscape, with all its emotional connotations (see Figures 1 and 2)

Regardless of whether the greenfield HPP is developed through a PPP or directly as a public investment, these issues make the process of developing hydropower plants complex, time-consuming, and inherently risky.

Figure 1:



Visual impact of one variant of the Andrijevo dam design on the River Morača, Montenegro.

Figure 2:



Visual impact of upstream of the dam for the variant presented in Figure 1.

IFC ADVISORY SERVICES EXPERIENCE

During the last five years, IFC Advisory Services in Public-Private Partnerships has been engaged as the government's lead transaction advisor in five hydropower PPP projects, and is engaged in the implementation of a rural electrification project that will develop a series of microhydropower plants.

With hydropower PPPs, the likelihood of closing a transaction in a timely and successful fashion is heavily influenced by the quality and completeness of the technical, environmental, planning, and legal preparation done in advance of the launch of the transaction. Therefore, IFC's work usually starts with technical, economic, and legal feasibility studies, followed by the marketing of the investment opportunity among suitably qualified investors, and implementation of a transparent tender process (the transaction) for the selection of the private investor.

LESSONS LEARNED

Lesson 1: Demonstrate a need for the project.

For a number of years, international environmental nongovernmental organizations (NGOs) harshly opposed one of the HPP projects (an IFC investment). The country's government and IFC responded to this criticism by sharing with the public a world-class Least Cost Electricity Generation Expansion Analysis¹ that demonstrated that the HPP was the cheapest new source of energy available to meet the growing demand. Conversely, in an HPP advisory project in a different country, the government chose not to perform a least-cost analysis, citing commercial confidentiality issues, and was later ill-equipped to respond to the opponents of the project.

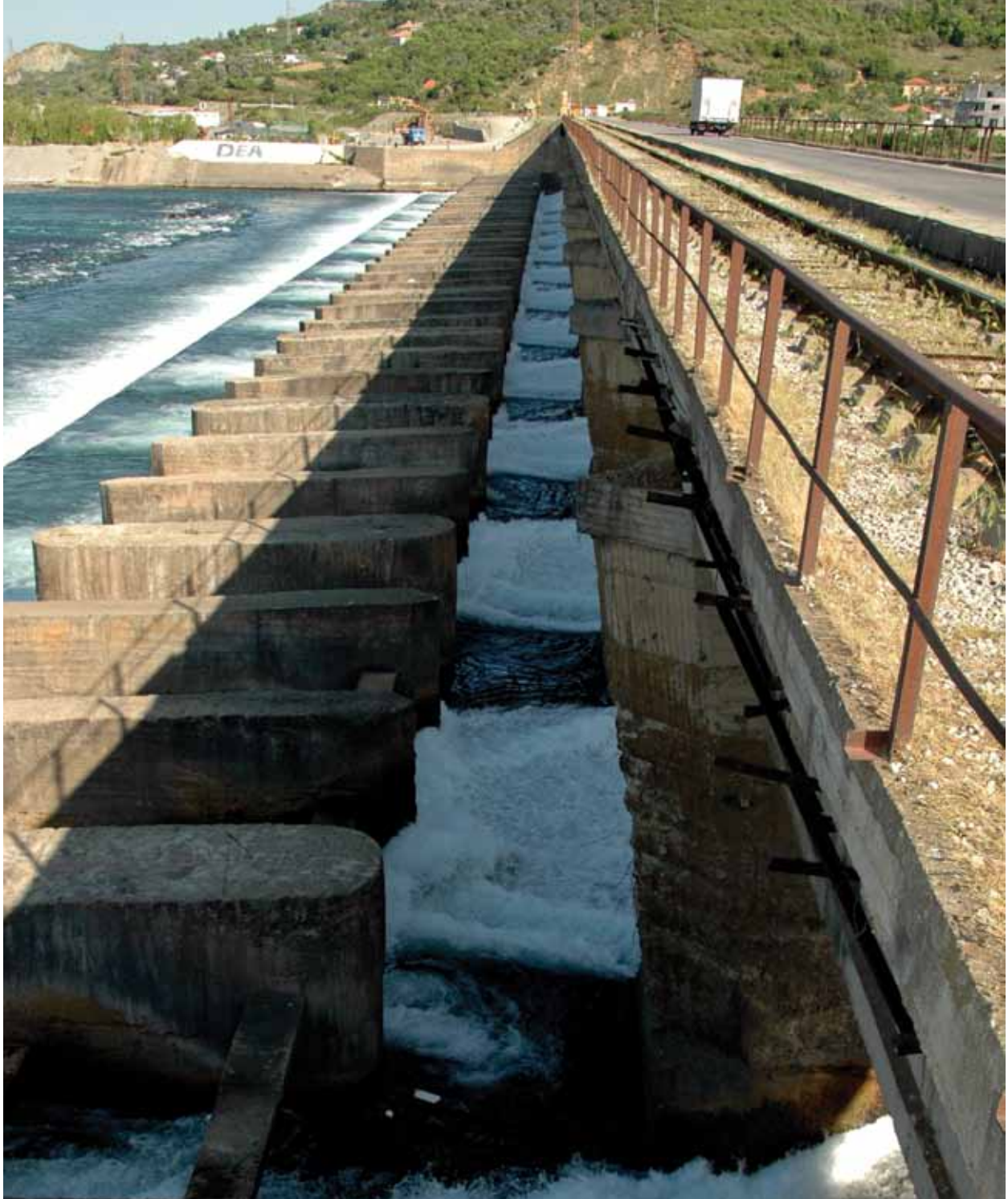
¹ The output of a Least Cost Electricity Generation Expansion Analysis is a list of new generation plants (chosen among a pool of candidates) and the optimal sequence for their development, calculated to minimize the present cost of power generation over a certain period of time.

Because of the negative local effects of hydropower projects, the public generally deems the profit (or economic development) motive insufficient justification for the transformation of a waterfall into a power plant. The best practice, reflected by the Hydropower Sustainability Assessment Protocol,² requires the demonstration of the specific need for the development of the hydropower resource through a Least Cost Electricity Generation Expansion Analysis that considers all alternative generation candidates. Governments (and IFC) should therefore engage in a hydropower transaction only if the analysis clearly demonstrates the need for the project.

Lesson 2: Conduct in-depth technical feasibility studies up front.

Governments (and, as is often the case, IFC as their transaction advisor) normally prepare for any new power generation transaction by studying the project's technical, environmental, and financial feasibility risks prior to approaching potential sponsors. The technological risk of HPPs is fairly limited, because the technology has not evolved radically during recent decades. The highest risks are in the escalation of construction costs due to unforeseen ground conditions. Because of this, technical feasibility studies need to investigate in great detail the geotechnical characteristics of the often inaccessible and mountainous site where the dam, tunnels, and powerhouse will be located. The implementation of a comprehensive plan of geotechnical investigations, sufficiently detailed to allow potential investors to assess risk and price their bids, requires a relatively long period (six to twelve months, depending, among other things, on the ease of access to the site) and can be done only at considerable expense. No bidder is likely to be willing to perform these investigations in the context of a competitive tender in which it has only limited odds of recovering its investment.

² Developed and endorsed by, among others, the World Bank Group and the World Wildlife Fund (a leading environmental NGO).



The site of the Ashta plant, on the River Drin in Albania.

To save time, to attract the largest possible number of interested bidders, and to lower the overall risk premium factored into the offers, governments should produce a comprehensive geotechnical assessment of the project before approaching potential investors.

Unfortunately, many countries are unable to afford the expensive up-front investment required by these studies. In response to this challenge in one particular case, IFC was able to mobilize almost \$3 million from donors to fund the technical, legal, and environmental feasibility studies, which included a small budget for geotechnical investigations. However, some sector specialists believed that, given the limited budget, the scope of geotechnical investigations that could be afforded was insufficient to mitigate the geological risk of the project. It took more than a year to implement the feasibility studies and reach the stage where the investment opportunity could be marketed to international investors.³

Lesson 3: Before involving the private sector, complete the strategic environmental and social assessment process.

In the development of new TPPs, the risk of not meeting national or international pollution-control and environmental standards can be mitigated almost entirely by requiring developers to invest in modern emission-control technology.

On the other hand, the very local nature of the impacts of HPPs is such that environmental and social impacts can rarely be meaningfully mitigated through improved design or technology. In addition, depending on the environmental impacts of the projects, the costs for environmental and social mitigation are substantial and can make the project financially infeasible.

³ Shortly after the completion of the feasibility studies, the government received an offer from an investor backed by a strong financial institution. Faced with choosing between a time-consuming tender process (with an uncertain outcome) and the possibility of starting construction preparation activities immediately, the government opted for the latter.

So, it is best practice (and a legal requirement in the European Union) to perform a systematic assessment of the environmental and social impacts of the project and to incorporate any environmental and social considerations resulting from such assessment before any plan for the development of a new hydro resource is approved. This means that a Social and Environmental Assessment (SEA) is required for the official government endorsement of any new hydropower project and for the amendment or approval of the associated land planning instruments.⁴ (See the box.)

Elements of a Social and Environmental Assessment

A best-practice SEA needs to contain, among other things, the following components:

- Definition of the boundaries of assessment and alternatives to be analyzed
- Description of the current state of the environment (including a biodiversity baseline study, which may cover the four seasons)
- A cumulative assessment of the potential environmental and social impacts of the project, including the upstream and downstream reaches of the river and an assessment of the impact on other users of the water resource
- Analysis of the potential economic and physical resettlement and a social impact assessment (including informing and consulting with the public)
- Description of the potential transboundary issues

⁴ Once the project concept is approved and the investor/developer has been identified, the approval of the final design and the authorization to start construction are normally subject to the preparation and approval of a more detailed environmental impact assessment.

For one HPP project, the preparation of the SEA and the implementation of the related public debates took more than one year, which caused significant delays to the launch of the tender for the selection of the sponsor. In addition, the SEA process was started in parallel with the prequalification process, causing a few potential investors to walk away from the project, because they feared that the tension typically experienced during the public debate could harm their corporate image.

To maximize the chances of success of the transaction, governments should not launch an HPP transaction until after the laborious SEA process is finalized in all of its parts.

CONCLUSION

Implementation of a greenfield hydropower project with a PPP model requires the mitigation of certain risks that private investors are reluctant to assume. For example:

- Mitigation of construction risk requires a considerable up-front investment in geotechnical investigations.
- Mitigation of environmental and social impacts and risks requires the completion of the SEA process, the public disclosure of numerous economic and environmental studies, the execution of public debates, and response to public concerns.

These tasks are considerably expensive and time-consuming and are best implemented by the host government before any transaction can be initiated for the involvement of private sector investors.

IFC's core competences are transaction structuring and implementation, and, for the most part, it possesses (or can access with relative ease within the World Bank Group) the technical know-how required to support governments in the implementation of risk-mitigation activities. IFC also (occasionally) can mobilize grants and donor funds to cover the costs of

these activities, but these funds are limited and can easily be tied up by one or two projects.

In any case, when the conditions listed in this SmartLesson are not met, the implementation of hydropower PPP transactions is likely to be riskier and require a commensurate investment of time and resources.

ABOUT THE AUTHOR

Nicola R. Saporiti is an Investment Officer for IFC's Advisory Services in Public-Private Partnerships. He has 12 years of international experience in infrastructure finance, focusing on hydropower, energy distribution, water, and solid waste transactions in Europe, Africa, and Latin America.

Approved by Georgi Petrov, Regional Business Line Leader, Advisory Services in Public-Private Partnerships, Europe and Central Asia.

Promoting Sanitation Markets at the Bottom of the Pyramid in Peru:

A Win-Win-Win for Government, the Private Sector, and Communities

Perceptions of sanitation vary widely among those living in poor rural and peri-urban areas of Peru. In 2007, the Creating Sanitation Markets (CSM) initiative—a multistakeholder effort led by the World Bank-administered Water and Sanitation Program—set out to understand those divergent perceptions and to explore new alternatives for increasing access to quality household sanitation in Peru. Using a market-based system for sanitation at the bottom of the pyramid, the initiative introduced a new paradigm for local sustainable development with the participation of private enterprise. This SmartLesson shares what we have learned from four pilot projects that have contributed to innovation in the sanitation sector in peri-urban and rural areas by adding new players and resources and opening new opportunities for improving access to sanitation while moving the agenda beyond coverage and poverty.

BACKGROUND

The CSM model seeks to build an equitable and harmonious relationship between supply and demand—through development of products and services that meet the expectations and needs of populations, encouragement of the state to assume a promotional role for the development of local entrepreneurship and the education of citizens, and development of financial options that allow the matching of supply and demand. The CSM’s objective—through increasing the poor population’s access to safe, sustainable, and low-priced sanitation services—is to improve their health and at the same time decrease the environmental impact of inadequate sanitation practices.

The initiative’s working strategy has four components: demand stimulation, product development, strengthening of the supply, and demand access to microcredit options. The CSM pays special attention to the active involvement of the private sector in sanitation

supply, promoting sanitation as a business opportunity to benefit local development as well. The model relies on key alliances and interactions among public and private actors. These alliances operate at local, national, and regional levels and are meant to provide platforms for sustainability and scalability of sanitation markets.

Since the end of 2007, the CSM initiative has been tested in four pilot areas that represent Peruvian geographic and cultural diversity, characterized by high levels of poverty, integrated by 47,813 households with an estimated population of 180,000 people. As a result of 24 months of promotion in these pilot areas, the households without access to sanitation decreased from 32 percent in 2007 to 21 percent in 2010. Approximately 9,000 households invested in new sanitation facilities or in improvements to current ones. The households’ investment has reached \$1.2 million, and the private sector has contributed about \$570,000 for training, promotion, and lending.



Peri-urban and rural households that invested in new sanitation facilities or in the improvement of their current one.

LESSONS LEARNED

Lesson 1: Change the market's perception of the end user from beneficiary to consumer.

One of the most important lessons for starting the market process is the promotion of new thinking among market actors, transforming their vision of target groups from beneficiaries to consumers. The idea is for market actors to take responsibility for finding solutions, rather than standing aside and waiting for outside solutions.

The nongovernmental organizations (NGOs) leading the pilot programs invested significant efforts in this paradigm change. The challenge was to convince local actors, as well as their own NGO staff, that this new sanitation approach was *not* to provide subsidized sanitation solutions to the poor. And they succeeded in doing so.

Their first step was to understand consumers' expectations, needs, and desires, which led to the development of behavioral studies—going beyond socioeconomic research—focused on finding the drivers of change. The studies found that health is not a top family motivator for investing in sanitation. In fact, they found a weak link between health conditions and sanitation in people's perceptions. The studies demonstrated that the main motivator for investing in sanitation is improving the house as a symbol of progress, and thereby enhancing social status. Water and sanitation systems are considered part of the urban culture and modernity. So, in the minds of many poor Peruvians, latrines are perceived as a factor of social “differentiation.”

The pilot phase showed that families who invest in sanitation help improve the use, maintenance, and sustainability of sanitation facilities. Following are some of the specific findings:

- 39 percent of families in the four pilot areas are definitely willing to invest in a new sanitation facility.
- 31 percent are willing to invest in the improvement of an existing facility.
- 62 percent think this investment will allow them to feel that they are progressing.
- 55 percent think their house will look more modern.
- 50 percent think this investment will make them feel proud of themselves.

These findings have prompted the CSM initiative to open the discussion to core questions: Are we ready to respond to demand expectations? What is the border between the “right” solution for people and the “desired” solution? Who decides?

Lesson 2: To achieve better segmentation of the population, identify the diverse segments of those at the bottom of the pyramid.

Expectations of sanitation facilities differ among poor households. Pilot intervention revealed a dual

perception of sanitation: a *private* perception, that of families, and a *public* perception, relating more to a vision of development of the community. The latter includes such issues as the final disposition of sludge and solid waste, the sanitation base infrastructure development (networks, systems, treatment plants), and operations and maintenance.

Evaluation studies conducted by the CSM found that discretionary criteria for segmentation are related to at least five categories: the household's income and ability to save, housing ownership, access to credit, the urban experience of family members, and family preferences regarding the concept of a bathroom and the methods of installation and purchase.

Taking into account the sanitation dual perception as well as the discretionary criteria, it is possible to define six preliminary segments: Four are household segments based on a mix of income and saving capacity with bathroom preferences. One segment focuses on sanitation as a community investment, and the other segment involves entrepreneurs looking at sanitation as a mechanism to increase business profits.

The payment capacity of poor segments is diverse and responds to a wide range of economic activities, income levels, expectations, and demands for social inclusion and progress in life. Specific findings include the following:

- 87 percent of CSM clients¹ are below the Peruvian poverty line.
- 86 percent of these families have purchased sanitation facilities, using their own resources exclusively.
- 8 percent have made the purchase through credit.
- 6 percent used a mixture of both.
- The median household investment was \$57, and the median credit amount was \$536 (with an average of 12 monthly payments).

¹ Households that invested in new sanitation facilities or in the improvement of their current one in the last 24 months.

- The most-purchased products were toilets (43 percent) and sinks (21 percent).

Lesson 3: To create affordable household sanitation solutions, look beyond simply finding the cheapest technology.

Providing an affordable sanitation option does not mean that the quality of products and facilities must be of lower quality. By using a mix of cost-saving measures, addressing the financing needs, and spreading costs out over time, the CSM experience has shown that almost any household can have a high-quality sanitation facility in the home. An affordability strategy should provide the consumer with options regarding financing, product, construction, installation, and timing of all of these components, to ensure that all consumers, regardless of economic status, can install the toilet or bathroom they desire and not be obligated to accept a product they do not want.

The CSM initiative developed an attractive and accessible “sanitation package” that includes a technology catalogue, installation and maintenance services, financing services, and information and orientation for customers. It also created an accessible point of sale for communities, building a good-quality local sanitation supply, using local materials and resources, and supporting local providers through validation of diverse certification programs. These programs were run in alliance with educational institutions, private suppliers' enterprises, and local governments.

The promotion of market mechanisms at the local level helped enhance the social and economic dynamic. Local employment in pilot areas was increased. Forty-one percent of the baths/latrines installed were made using local service providers who were trained by the CSM initiative. At the same time, local hardware stores have been increasing their sales, with 48 percent of families preferring to acquire toilets, sinks, showers, and baths locally.

Despite these results, questions remain. The sustainability of the actors' interaction continues to be an unreached goal, along with how to develop for service providers a sustainable accreditation mechanism that can assure quality standards in an informal country such as Peru. Another question involves how to link people's desires (a bathroom with shower, sink, and toilet), their willingness to pay, and the country's water-saving challenges.

One promising effort—headed by six private enterprises (four suppliers, one international bank, and one private foundation)—is to scale up a sanitation package under an umbrella brand tentatively called “Mi Baño” (My Bath). The package includes goods, construction and installation services, financing options, information, orientation through

community promoters and points of sale, and guaranty and maintenance mechanisms.

Lesson 4: Target financial solutions according to income level.

Reaching all income levels of the population requires innovative financing alternatives, such as group lending, retail direct credit, or market-based subsidies. The CSM results identified three distinct segments: the upper poor, who can be easily reached by the traditional financial sector (banks and multilateral financial institutions, or MFIs); the middle poor, a key target segment of the population that does not usually have access to formal financial supply; and the bottom poor, people in extreme poverty who receive government subsidies.



Peri-urban and rural households that invested in new sanitation facilities or in the improvement of their current one.



Peri-urban and rural households that invested in new sanitation facilities or in the improvement of their current one.

The first segment has sustainable income and/or limited saving capacity (\$215 to \$358 monthly household income). Progressive home-improvement financial products are a great opportunity for this group. The CSM initiative has not had enough success in involving banks and MFIs for launching ad hoc sanitation loans. But, promising signs include dissemination activities to increase sanitation awareness and the benefits of prioritizing them in home upgrading; implementation of a system to pay commissions to promoters or retailers that provide loan clients; and establishment of alliances for sharing sanitation-promotion investments.

For those in the middle poor (\$90 to \$215 monthly household income), the challenges are bigger. The CSM initiative has validated diverse financial alternatives in an effort to determine how to reach

that segment with a viable cost-effective financial product. These include the village banking model, through NGOs, and credits directly from hardware stores and from community water committees. Although the first CSM monitoring reports show clients' satisfaction, very low delinquency rates, and increasing access, there remain critical barriers to replicating these community financing approaches in a sustainable manner. These obstacles are related to inadequate population profile evaluation tools and to limited credit terms. The low education level of this segment requires significant investments in training to operate those financial mechanisms. The NGOs' successful management of village banks indicates that an intermediary is required to promote the formation of the group and to provide continual training and monitoring, which requires resources and expertise.

The still unanswered question is whether subsidies are the only alternative for the extremely poor (less than \$90 monthly household income). The initiative has tried to prove the viability of market-based subsidies by offering households an opportunity to choose the toilet or bathroom they would like to have. In the Cajamarca pilot zone, the initiative has formed a self-help savings and lending group with women members of the direct-transfer cash program, Juntos, a government antipoverty social program that provides a bimonthly subsidy of \$70 per household. The lending model has a cross-guarantee system that allows households to improve sanitation access through buying materials or paying for labor.

Lesson 5: Do not underestimate the private sector's role.

The CSM initiative results show an enormous potential for the private sector to contribute to improving sanitation services for the poor. Peruvian economic growth rates suggest opportunities to identify new actors interested in improving people's living conditions. Today, more than in the past, the private sector enterprises understand that they need consumers' satisfaction to survive. When people feel comfortable with their own well-being (feelings, access to basic services, education, and so on), they have more expectations and greater awareness of their needs.

The private sector has proved that it is able to deliver household loans for sanitation; enhance the knowledge of retailers, thereby improving the supply chain and the service quality at the point of sale; support research and innovation to discover new materials and processes in accordance with environmental policies, resulting in products of better quality, price, and environmental impact; create quality information systems for consumers and invest in educational campaigns; and improve the quality of health and sanitation conditions of its workers, thus creating a better physical and emotional business

environment, which in turn can lead to enhanced productivity and well-being.

CONCLUSION

The CSM initiative's approach to sanitation implies a change of paradigm and renewed roles for different actors, especially the customers (households and communities), who prioritize sanitation investments, demand information, and use and maintain sanitation services. This approach also needs an articulated local supply that offers customers an integrated solution, including goods, services, financing, and information. Private sector enterprises should develop sanitation businesses at the bottom of the pyramid or include sanitation as part of their business model, and governments should promote sanitation markets as a matter of policy. Sanitation market development requires identifying potential public and private partners at the national and local levels; providing technical assistance to build partnership platforms that address different institutional incentives for promoting the sanitation markets; supporting the implementation partners; and advising government in identifying entry points for mainstreaming and scaling up this concept in national-level programs. Probably the most important lesson is that there is not just one way to reach the goal.

ABOUT THE AUTHOR

Malva Rosa Baskovich is Coordinator of the Creating Sanitation Markets initiative, Water and Sanitation Program, Latin America and Caribbean. Malva is a social marketing specialist with experience in entrepreneurship, health and sanitation programs, and advocacy and policy initiatives.

Approved by Glenn Pearce Oroz, Regional Director of the Water and Sanitation Program-LAC.

Taking a Stake in Emerging-Markets Water Companies

In building its water sector business, IFC has found that equity or quasi-equity investments in private companies (often holding companies) with assets in emerging markets increase reach, impact, and financial returns, when compared to debt financing provided to a project company. This SmartLesson provides guidance on investing in water companies by sharing some key lessons on selecting the right partners, structuring the deal to avoid conflicts of interest, and balancing revenue streams.

BACKGROUND

IFC has been investing in the water sector since the 1990s, and these investments have produced mixed results in development impact indicators. More recently, in the early 2000s, IFC diversified its water portfolio to include water companies operating in developing countries, and as a result, seven new water company transactions were signed in 2010.

LESSONS LEARNED

Lesson 1: Select a strong technical partner with a healthy capital base.

Over the last few years, IFC has been looking for ways to support increased private sector investment in a number of regions where water and wastewater networks urgently require rehabilitation and upgrading. Opportunities for IFC grew out of the huge scope for operational improvements in these regions (due to the limited expertise of the existing domestic water companies) as well as the large growth potential as governments gradually show willingness to implement reforms that will open up the sector to private sector participants.

When supporting new entrants into a region, it is important that they have the following three characteristics:

Solid track record:

- operational improvements—efficiencies and economies of scale
- demonstrated ability to replicate and scale a business model through know-how transfer
- ability to navigate similar tariff and contractual considerations
- reputation for good customer service
- a platform of existing operations in other regions

Financial strength:

- well-capitalized and, hence, well-placed to move quickly after new opportunities
- able to use capital base and other resources to execute on multiple projects at one time
- able to take advantage of attractive opportunities arising from market downturns, such as discounted asset valuations and cash-strapped local sponsors or municipalities willing to engage partners in discussions



Changes in how water is transported can transform people's lives.

Willingness and ability to cultivate productive and stable relations with local partners and government counterparts:

- capability of cultivating local partners that can be very important for a sponsor's understanding of the political and social context and can also work with the sponsor to develop a solid pipeline of projects for future investment
- partner integrity screening capabilities to ensure that the local partners are people with whom IFC would be comfortable doing business

Lesson 2: Structure water deals to capture all value and avoid conflicts of interest.

Many global water companies are part of construction groups or operating companies and pursue emerging markets water investments (Build, Own, Operate, Transfer or BOOT) as a means of building their engineer,

procure, and construct (EPC) and operations and maintenance (O&M) business. The special project vehicles (SPVs) set up by such global companies often contract out the EPC and O&M to subsidiary or affiliated companies, which can create a conflict of interest. In such structures, the parent company's interest is often to protect profits at the EPC and O&M level rather than at the SPV level.

If IFC invests in a holding company that includes the SPV assets but not the EPC and O&M business, it is exposed to this risk. Mitigants to this risk include the following:

- Projects secured by transparent international tender where projected shareholder returns remain high
- Independent shareholders who are not party to EPC or O&M contracts and whose interests are aligned with the financial outcome at the SPV level

- Internationally reputed, independent technical advisor evaluation of EPC and O&M costs to ensure conformity with market benchmarks
- Contractor structure (with parent company support) to ensure that unpaid claims and cost overruns are passed through to EPC and O&M contractors and not held at the SPV level

Perhaps the best mitigant is to invest at a higher company level, which captures the value of all contracts (BOOT, EPC, and O&M) and thus avoids conflicts of interest. However, it remains important for IFC to ensure that most of the profits are not extracted through the EPC contracts, since IFC is only interested in investing in **sustainable** water businesses where cash flows generated by a profitable

portfolio of operating subsidiaries will support investments in new projects in the future, hence creating more development impact.

Lesson 3: Balance a diversity of revenue streams in the valuation of water companies.

Valuation of water companies is no different from valuation of other types of companies. Traditional methodologies, such as multiple comparables or discounted cash flows, apply equally and are commonly used to value water companies. However, the following key factors need to be considered:

- **It is important to break up the valuation into smaller pieces that have similar risk profiles and are easier to compare with others.** For example, if the company has an EPC business and investments

Access to safe drinkable tap water is key.



into assets (for example, BOOTs), valuation of each must be done separately, because discount rates and multiple comparables can be significantly different in each segment. Similarly, if there are assets with different risk profiles (subject or not to market risk due to existence of take-or-pay obligations), a different discount rate might apply to each segment to value such risk. Also, consider breaking down valuation by geography (discount rates might be different for different countries).

- **It is important to use multiple comparison (EBITDA, P/E)¹ to make sure valuation is in line with the market, but it's also important to make sure comparisons are made with companies with similar risk profiles and projected growth rates.**

Tariff escalation plays an important role, because typical BOOTs carry indexation formulas based on cost increases or other parameters that, in turn, are based on factors such as inflation. Assumptions made on such underlying drivers can cause significant distortions in the valuation. The key to avoiding such distortions is to have consistency between underlying assumptions in the projections of the cash flows and in the discounted rates used (for instance, the same inflation rates are used for calculating the discount rate).

CONCLUSION

IFC investments in private water companies in emerging markets have the advantages of increasing the diversity and impact of our investments and generating on average an impressive return on investment. As a result, they should be considered a serious option when looking at opportunities to support the development of the water sector in any client country. At the same time, it is critical to take into consideration the lessons just described when undertaking investment in water companies.

¹ EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization); P/E (price-to-earnings ratio).

ABOUT THE AUTHORS

Patrick Mullen is a Water and Sanitation Specialist for the Global Water Unit in the Infrastructure and Natural Resources Investment Department. He has more than 20 years' experience in the international water business.

David Tinel is a Principal Investment Officer for the Global Water Department. He has worked mostly on investments in water and sanitation projects since joining IFC as a Senior Investment Officer in 2005.

Alice Laidlaw is a Senior Investment Officer for the Global Water Department. She joined IFC in 2004 and has worked on new business and portfolio projects in the power, transport, and water sectors since 2005.

Miguel Toledo is a Principal Investment Officer for the Latin America and Africa Natural Resources Department. He joined IFC in 2005 and has worked in infrastructure business for 12 years.

Francesca McCann is a Consultant with the Sustainable Business, Energy and Water unit of Business Advisory Services.

Approved by Usha Rao-Monari, Global Head for the Water Unit in the Infrastructure and Natural Resources Investment Department.

Private Operators and Rural Water Supplies: Can It Work?

Numerous cases demonstrate that private operators can improve water services in rural small towns. But what about very small rural settlements or scattered rural homesteads? A recent World Bank study¹ reviewed 25 initiatives that aim to do precisely that—to use private operators to manage water infrastructure that serves, on a significant scale, dispersed rural households or rural settlements with populations under 5,000. This SmartLesson documents some of the findings from that study and shares lessons about how to improve rural private operator initiatives.

BACKGROUND

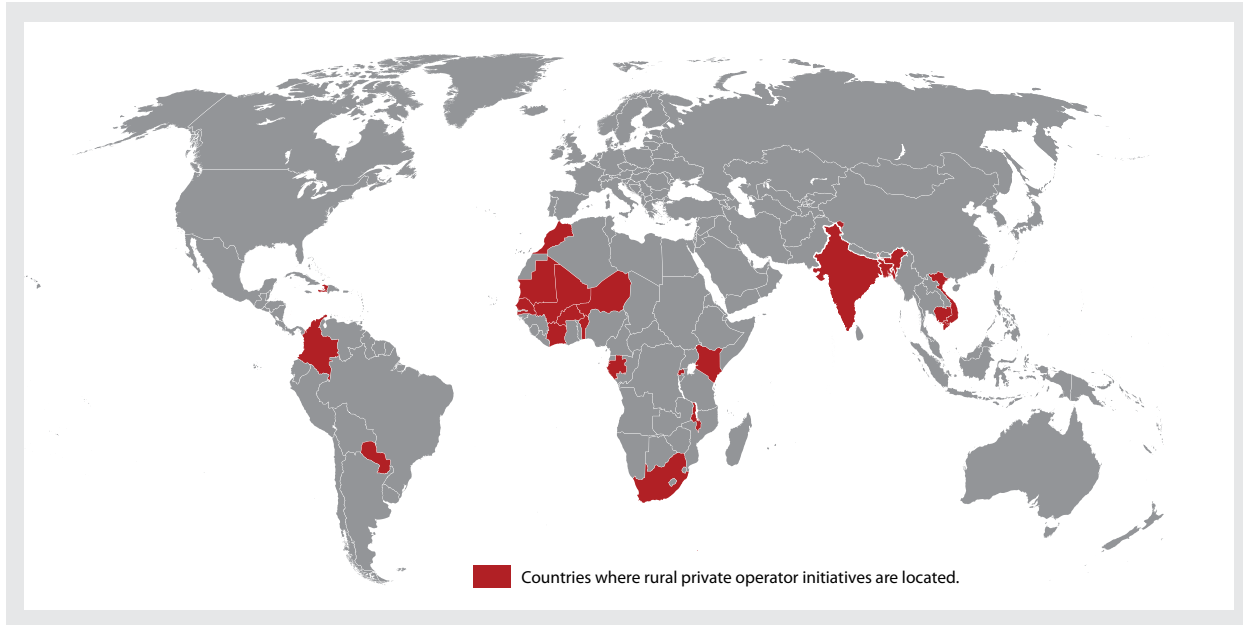
Private operators will engage only if the systems are or can become profitable. Cities and small towns tend to have lower delivery costs, greater demand, and more potential for profitability than rural communities. Rural areas have low population densities and incomes, poor communication, and a weak cash economy—all factors that hurt the bottom line. Therefore, rural water supplies typically are operated through community management, where consumers keep down costs by establishing a village committee or nonprofit association to manage the supplies.

The community management model for rural water supplies has produced many success stories—but also many failures. Due to the latter, governments and their development partners in Benin, Burkina Faso, Mali, Malawi, Mauritania, Niger, and Rwanda are testing or implementing rural private operator models as a means of reducing the high numbers of nonfunctioning water supplies in their rural areas and

improving the technical and financial performance of the systems in general. One IFC-assisted development bank in Kenya now requires that private operators manage community water systems for the duration of the loans that the bank provides.

Elsewhere, governments and their partners are looking to private operators to provide the expertise, managerial know-how, and sometimes even the financing needed to construct and operate increasingly complex rural water infrastructure. A Bank-assisted project in Senegal will investigate using private operators to manage large rural schemes that serve numerous small settlements. In Vietnam, the Bank supports a project that will vest the assets of rural piped schemes in provincial utility companies, in the expectation that scheme management in each province will eventually be contracted to a private operator. In Paraguay, Bangladesh, and Cambodia, the Bank has used build-and-operate contracts to leverage financing from the eventual private operators and thus create added incentives for the operators to run efficient operations to recoup their investments.

1 Kleemeier, Elizabeth. November 2010. "Private Operators and Rural Water Supplies: A Desk Review of Experience." Water Anchor, World Bank, Washington, D.C. Available at: http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/11/11/000334955_20101111025741/Rendered/PDF/578310WP01PUBLIC10BOX353779B0rpostudy.pdf.



Objectives for rural private operator initiatives are diverse:

- Improve technical and financial performance;
- Provide the expertise to manage more complex technologies; and
- Leverage private financing and investment.

The 25 initiatives reviewed by the World Bank study (see the map) have pursued these objectives in varying combinations and to different degrees. Their activities range from grassroots actions by rural entrepreneurs, to investment programs by the World Bank Group or other donors, to national policies establishing a new approach to rural water supply. The initiatives come from around the world. Some have been under development and implementation for five years or more and have shown good results. Some are recent efforts that show promising results, while others have had disappointing starts.

LESSONS LEARNED

Lesson 1: Invest the time and resources necessary to build broad support for the concept.

For the concept of using rural private operators to gain the traction and support necessary to go to scale, governments and development partners have to buy into it. Achieving this objective requires good communication, alliance building, and the strategic use of various lending instruments, sometimes in combination.

In Benin, the Bank used budget support operations to forge agreement among donors and the government to expand the use of rural private operators in settlements with populations between 2,000 and 25,000. The Bank and other donors contributed to a basket fund to support the initiative. In addition, the Bank's third, fourth, and fifth Poverty Reduction Strategy Credits (PRSCs) included triggers that set targets for the numbers of schemes to be managed by private operators.

Rwanda has a similar story. The Bank began a rural water supply project there in 2000 that adopted a community management approach. As part of the mid-term review, the project commissioned a study comparing the performance of community-managed rural schemes to that of a private operator approach initiated by district authorities in one province. The findings in favor of the latter were widely discussed and disseminated. As a result, the Bank-assisted project changed to this approach, and a prior action for the second PRSC was that similar management contracts would have been signed in at least one district from each of four pilot provinces. The Poverty Reduction Strategy paper set a target for 10 percent of rural water supplies to be managed privately by 2007. The target was overfilled, with about half of the contracts going to the private sector and the remaining ones to third-party operators such as cooperatives.

The common element in these two cases is that the Bank worked with the government and other major partners in the sector to develop and implement the new approach. In other countries, Agence Française de Développement and other donors have taken the lead in bringing together the major players around a common approach based, at least in part, on using rural private operator initiatives.

Lesson 2: Design a rural private operator initiative to fit the organizational circumstances in the country.

Rural private operator initiatives are often associated with decentralization, as a way for local governments to handle the responsibility for providing water services. Benin, Burkina Faso, Mali, and Rwanda have all introduced a design for rural private operator initiatives in which



Private operator observes the fishpond connection to the piped scheme in Bogra District, Bangladesh.

Types of Lead Organizations in Rural Private Operator Initiatives*

	DECENTRALIZED			CENTRALIZED		
Rural Entrepreneurs	Local Government	Utility	Ministry	Agency	Utility	NGO/Private
Vietnam	Benin	Malawi	Niger	Mauritania	Côte d'Ivoire	India
Cambodia	Burkina Faso	Vietnam	Senegal	Paraguay	Gabon	
	Mali		Bangladesh		Morocco	
	Rwanda					

* With examples of countries using them.

local governments sign contracts with private operators to run rural schemes.

However, rural private operator initiatives can be designed to work in situations where local government has not been delegated water-provision responsibilities. Six other types of organizations or groups have taken the lead in rural private operator initiatives. (See the table.) These organizational designs have been used in countries where the central government has not decentralized rural water-provision responsibility to local government, where decentralization has been weakly implemented, or where utility companies offer an alternative to local governments for overseeing the private operators.

It is not a question of choosing the best organizational design—for the moment, we lack sufficient experience to say one design has unequivocally produced better results than others—but rather of selecting a design that fits the context.

For instance, private operators have been put in charge of managing rural water schemes in Côte d'Ivoire and Gabon as a by-product of introducing public-private partnerships largely to serve urban areas. ONEP, the national utility in Morocco, is experimenting with local private operators in the wake of a government mandate for it to supply rural areas. In these cases, rural private operators were introduced through national utilities as a result of other organizational

changes happening in the sector.

In Senegal, Niger, and Bangladesh, central ministries have taken the lead in rural private operator initiatives, because the government has not decentralized water provision. There may be scope to improve these more centralized designs by carving out a larger role for local government in the supervision of the private operator contractors, as a recent evaluation of Bank-financed schemes in Niger recommended. Overall, however, the initiatives will remain distinctly different from ones where real decentralization has taken place.

Lesson 3: Think through regulation and professional support services.

Some initiatives have focused too narrowly on the bidding and contracting process. The resulting management models lack sufficient accountability and do not provide the various actors—local governments, water user associations, local tiers of the water departments, and the operators themselves—with the support they need to take on new roles successfully.

Advocates for trying rural private operator models initially argued that they would not require as much institutional support as community management to work well. Governments too often had neither the capacity nor the financial ability to deliver this support. (Some researchers rather cynically argued that community management appealed to governments

precisely because the model allowed them to wash their hands of responsibility for rural water supplies after construction.)² The first discussions of rural private operator models in the literature suggested that this approach would require less support from government than community management.

The review of 25 initiatives shows such optimism to be misplaced, at least in the foreseeable future. Rural private operator models do not so much abolish the need for local institutional capacity, as they better define what capacity is needed where. That redefinition is based on applying to rural water services the same conceptual categories that have long been used for the urban sector: asset ownership, oversight, operations, regulation, and professional support and training.

Mali has developed an approach that combines regulation and support services. The national water department contracts two private firms to run a national unit that carries out a twice-yearly financial audit of rural and small-town piped schemes, and offers advice by radio on technical problems, repairs, and spare parts. The structure was supposed to pay for itself through a fee paid by the service provider based on the volume of water produced, but the amount collected has not covered costs. Niger has a somewhat similar system, in that some projects have established a regional bureau managed by private firms to provide technical and financial support, auditing, and monitoring to rural piped schemes.

Neither system is ideal, because regulation and support services should be separate to avoid a conflict of interest. However, some kind of system is preferable to no support or regulation.

2 Harvey, Peter A., and Robert A. Reed. 2007. "Community-managed water supplies in Africa: sustainable or dispensable?" *Community Development Journal* 42 (3): 367.



SEEG, the national private operator in Gabon, manages small rural schemes.

Lesson 4: Use build-and-operate contracts and output-based aid designs to create incentives for the operators to manage construction and operation effectively and efficiently.

One private operator in Burkina Faso cited four advantages to build-and-operate contracts: 1) a firm will do quality construction of a system that the firm must subsequently operate; 2) there can be no subsequent disputes between the operator and the other parties about the state of the infrastructure; 3) the operator will be completely familiar with the system; and 4) time is saved in the contracting process.

The Bank has used output-based aid designs and a requirement of private financing to add to these advantages. Projects in Paraguay and Bangladesh illustrate how this works:

- **In Paraguay**, government subsidies to rural water supplies had become larger than intended, because rural communities were not making their up-front cash contributions or repaying their government loans. The Bank's fourth rural water supply project offered build-and-operate contracts in which the bidders competed on the size of the subsidy that they would require from governments. The terms of the contracts required the winning bidder to provide all

the initial financing. The company would recover up to 80 percent of the construction costs from the government (its subsidy to rural schemes) after achieving the output targets, and the rest mainly from connection charges. Thus, to recover their investment, the contractor-operators had to do a good job of managing construction and bill collection.

- **In Bangladesh**, the Bank project initially set much more stringent conditions: The operator would invest 50 percent of the rural piped scheme's cost, collect an additional 10 percent of the cost from the community as its contribution, and provide all of the initial financing. The project would reimburse 40 percent of scheme costs as construction targets were achieved. However, these terms were too onerous to attract the private sector, and the nongovernmental organizations that were interested could not afford that level of investment. The project was restructured, and the operators' required investment was lowered to 20 percent. The project has completed 21 schemes, whose operators will now have to manage them at a profit to recoup their investment. Introducing even a few schemes that are operated on a financially sustainable basis represents an achievement in Bangladesh, where rural people are generally unwilling to pay for water when they can get it free from hand pumps.

Lesson 5: Grouping schemes can increase their economic viability, and hence their appeal to operators.

Numerous factors weigh against the profitability of rural water supplies. Fixes for unprofitable schemes include metering and subsidized private connections to increase households' consumption and willingness to pay. Another tactic is to tender schemes in lots, based on proximity.

In Burkina Faso, the program to implement a rural private operator model tendered two packages—of seven and eight schemes, respectively—as build-and-operate contracts. Vergnet Hydro, the French firm that won one package, found that the ability to spread costs

and revenues across several schemes was indispensable to the firm's entry into the market. In Paraguay, one bidder won the first four scheme contracts, tendered separately, commenting that winning all four was necessary to achieve economies of scale. In Benin, the profitability of scheme management for operators has been limited by so many of them having only one scheme.

CONCLUSION

Governments and development partners will implement more rural private operator initiatives over the coming years, because this model has shown results in situations where other management models performed poorly. The planners and implementers behind these initiatives will do a better job if more information is exchanged among practitioners as to what works and what does not.

ABOUT THE AUTHOR

Elizabeth Kleemeier is a Senior Water Supply and Sanitation Specialist in the World Bank's Water Anchor Sustainable Development Network Vice Presidency.

Approved by Julia Bucknall, Manager of the Bank's Water Sector Anchor unit.

First-Ever Successful Public-Private Partnership in Egypt!

New Cairo Wastewater Treatment Plant

Besides being the first-ever public-private partnership (PPP) under Egypt's PPP program, the New Cairo Wastewater Treatment project is IFC's first infrastructure advisory project in the wastewater sector. IFC advised the government of Egypt on the structuring and execution of the 20-year PPP to design, finance, construct, operate, and maintain a new 250,000-cubic-meter-per-day wastewater treatment plant in New Cairo. The project was awarded to a consortium in May 2009, following an international competitive tender process, and reached successful financial close in February 2010. This SmartLesson describes key aspects of this pioneering PPP project and shares some lessons we have learned from it.

BACKGROUND

New Cairo City, a new satellite town on the outskirts of Greater Cairo, is promoted as one of the centers to help alleviate the problems of urban overcrowding in Greater Cairo (population estimated at about 20 million). New Cairo City itself, with primarily residential and institutional demographics, is growing rapidly. Its current population of approximately 550,000 is expected to increase to about 3 million over the next 20 years.

Not surprisingly, the Egyptian government has identified water sanitation and supply as priority sectors. The existing infrastructure is insufficient and of poor quality, rapid population growth places increasing pressure on these services, and investment requirements are significant. To support the growth and provide improved services, the Egyptian government embarked on a major program to expand and improve public infrastructure through PPPs. The New Cairo Wastewater Treatment Project is part of this PPP program promoted by the Ministry of

Finance and implemented under the leadership of a newly established PPP Central Unit.¹

Key objectives of the Egyptian government included:

- provision of adequate water sanitation to the population of New Cairo to meet current and projected growth;
- implementation of a model PPP transaction in the urban services area, which can then be replicated in other parts of the water sector;
- mobilization of private sector finance and know-how.

DIFFICULT CONTEXT

When the project was launched in 2007, a difficult context existed for private investment in Egyptian infrastructure due to the country's recent frustrating experience with private participation in the electricity sector. Three independent power projects were awarded

¹ The PPP Central Unit is a department of the Ministry of Finance. For more information, visit: <http://www.pppcentralunit.mof.gov.eg>.

between 1996 and 2003, but a major devaluation of the Egyptian pound between 2003 and 2005 doubled the local cost of power purchases under the dollar-denominated contracts. Additional costs associated with the devaluation, plus lack of equity commitment (with all original international sponsors exiting the projects), affected public perception of private participation in infrastructure projects. Furthermore, the Egyptian government made the difficult decision not to offer any protection against foreign exchange risk on any future contracts with foreign investors, despite IFC's recommendation to offer such protection.

With no hedging instruments available in the market, and payments to investors denominated in Egyptian pounds, a key success factor was to structure a project that could be locally financed, still be attractive to international investors, and create value for money for the Egyptian government.²

The project was one of a series of five PPPs simultaneously launched by the Egyptian government in 2006, and for which IFC Advisory Services in Public-Private Partnerships acted as Lead Transaction Advisor under a common memorandum of understanding. The other four projects covered by the memorandum were a nationwide schools project, a potable water project in New Cairo, a highway project between Cairo and Alexandria, and a hospitals project in Alexandria.

LESSONS LEARNED

The following lessons explain why the New Cairo Wastewater Project was the first in the Egyptian PPP program to close successfully.

Lesson 1: The project needed to include an adequate payment structure that would

attract both local and international investors and meet local lenders' requirements.

According to an article, "Waiting on New Cairo," in the November 19, 2009, issue of *Project Finance Magazine*, the challenge for Egyptian banks was that "there are few precedents for long-term project lending, and a lack of pricing benchmarks. Historically, large projects have been financed in dollars, and a deal such as the New Cairo PPP, where tenors could be pushed out to 15 years, is the first of its type."

So, to design an appropriate structure and make the project bankable, it was essential to engage in early discussions with banks and investors. Key requirements included the following:

- The payment structure should match the cost structure of the project and, at a minimum, guarantee payment of debt service and equity return.
- The project should take into account the history of high inflation in Egypt, which spiked at a 19-year high of 19.7 percent in May 2008, though it has since come down.
- Given the impossibility of fixing a long-term interest rate in the local market, the contract should offer appropriate protection against changes in interest rates.
- The Ministry of Finance should provide credit enhancement for the payments to be made by the New Urban Communities Authority (NUCA), to backstop the limited creditworthiness of the off-taker.

Thus the Service Treatment Charge (STC), paid quarterly and denominated in Egyptian pounds, comprised: 1) a fixed capital charge to cover the fixed costs of the investor, including debt servicing and return on equity; 2) a fixed operating charge to cover all the fixed operating costs; and 3) a variable operating charge based on the actual volume of treated sewage, and designed to cover the variable costs. Electricity costs were a pass-through item paid by NUCA in addition to the STC, up to a predefined

² The benchmark Egyptian Central Bank overnight rate was as high as 11.5 percent during 2008. Local currency debt costs are thus considerably higher than U.S. dollar project loans.

cap introduced to foster energy conservation and sustainable operation of the project by the investors.

Two types of periodic adjustments would apply throughout the contract duration:

- an annual adjustment for inflation, commencing on the first year following the start of operations, applicable to the fixed operating charge and the variable operating charge of the STC; and
- an adjustment for interest rate changes, the first adjustment taking place at financial close (to cover changes in interest rates after the bids submission date) and subsequent adjustments every three years, based on interest rates applicable for three-year³ certificates of deposits issued by reference⁴ Egyptian banks. (It is important to note that the contract also includes a provision to incentivize refinancing, should the Egyptian debt market become more mature and offer possibilities to extend fixed tenors.)

Finally, NUCA's credit was underpinned by the Ministry of Finance through a direct agreement signed with the lenders, providing sufficient comfort to investors and lenders.

Lesson 2: The "programmatic approach" has certain advantages.

As mentioned above, the project was one of a series of five simultaneously launched PPPs in Egypt in 2006. This programmatic approach had clear benefits for both the client and IFC:

- Each project team leveraged lessons learned from other transactions, including essential feedback

³ Three years represented the longer tenor available in the Egyptian market to fix interest rates at the time the project was structured and tendered. Although tenor of senior facilities could be extended to 15 years, interest rates would change every 3 years.

⁴ Reference banks were defined in the contract as "four (4) banks that are certified by the Central Bank of Egypt, of which two (2) are public sector banks."

from potential investors on conditions to enter the new Egyptian PPP market. Thus, for example, the New Cairo Wastewater contract used standard clauses previously developed for the Schools Project, including those relating to inflation and interest rate adjustments. Communication between the teams was essential, including through formal monthly updates circulated to the teams involved in Egyptian projects.

- Some institutional infrastructure investors praised this approach, because they found some synergies between the projects and could leverage resources to work in Egypt. The approach gave clarity to the market regarding the Egyptian government's commitment to the PPP model by defining a clear and credible PPP agenda, and it helped IFC rapidly develop a deep relationship with the client by leveraging multiple projects simultaneously and providing more presence in the field.
- The programmatic approach enabled the government and IFC to rapidly test the market in several sectors, which ultimately helped define realistic priorities for the Egyptian PPP program, in line with market appetite. Thus, following the success of the New Cairo Wastewater pilot project, two other wastewater projects were quickly launched as soon as October 2009,⁵ using the same contractual documents developed by IFC. IFC played a significant role in leading a pioneering transaction and thus opened the market. As a result, new international advisors and investors were now sufficiently comfortable working with the government of Egypt on other wastewater PPP projects.
- It provided more visibility to the Egyptian PPP program, both in local media and in the international press that specialized in project finance, hence helping build the credibility of the Egyptian government to deliver attractive PPPs.

⁵ The two projects are the wastewater treatment plant for 6th October City and the Abu Rawash wastewater treatment plant in the Giza Governorate.



Wastewater treatment plant.

Lesson 3: However, it is important to weigh the negative aspects of the programmatic approach before replicating it in countries with no prior PPP experience.

Following are some points to be alert to:

- A programmatic approach can significantly delay implementation of projects, with the risk of losing momentum and investors' interest. The New Cairo Wastewater Project experienced such a delay due to the Egyptian government's decision to give priority to the Schools Project, which was more politically sensitive though more challenging.
- Projects can suffer from a "negative replication effect": difficulties or deterioration of the client relationship on one particular project can immediately affect other projects.

- If the client intends to develop "standard contracts" for a PPP program, it is risky to launch several large projects in parallel: any significant change in the contract of one project will need to be reflected in contracts of all other projects, hence delaying all transactions.

Lesson 4: When entering a new market, such as Egypt, it is advisable to start with the "low-hanging fruit"—a transaction of manageable size in a more traditional sector, a sector in which IFC has a good understanding and in which lenders are comfortable to lend.

It is too risky to start a new PPP program with a very large or innovative project. For example, it was a bit ambitious to start the PPP program in Egypt with the Schools Project—a large and complex transaction involving more than 300 schools scattered all over the

country. Unfortunately, the multisite nature of the project and the limited number of institutional investors in this sector, combined with fierce competition from other real estate projects that were more attractive to engineering, procurement, and construction contractors in 2006–2008, resulted in limited investor appetite, and ultimately in the cancellation of the project.

On the other hand, the New Cairo Wastewater Project was an ideal candidate for a first PPP in Egypt. It had a more manageable size and was in a sector with well-established local, regional, and international investors. Based on IFC due diligence and market feedback, the capacity of the plant was reduced from 500,000 to 250,000 cubic meters per day, making it simpler to raise the required financing. The clear output-based nature of the contract also made it more straightforward for local banks to structure the debt package. A transaction of this size and nature helps build the credentials of the government, increase investor confidence, and educate local banks before engaging in more complicated PPPs.

CONCLUSION

Despite a difficult environment for infrastructure projects in Egypt in 2007, the IFC team successfully closed the New Cairo Wastewater Project in May 2009. Financial close was reached in February 2010, and operations of the new plant are expected to start in February 2012. This groundbreaking project showed that it was possible to design a PPP project that would foster energy conservation and sustainable operation without negatively impacting value for money for the government. It also paved the path for other PPPs: two other wastewater projects have already been launched by the Egyptian government under the same model, thus immediately demonstrating the New Cairo Wastewater Project's strong replicability potential.

ABOUT THE AUTHOR

Muneer Ferozie is a Principal in IFC Advisory Services in Public-Private Partnerships, with experience in investment banking and infrastructure advisory. Muneer focuses on origination and execution of privatizations and PPP projects in the infrastructure sector for the Middle East and North Africa region.

Aurélien Boyer is an Associate Investment Officer with IFC Advisory Services in Public-Private Partnerships and is based in Dubai. Aurélien has international experience in financial services, including corporate finance, leveraged finance, project finance, and PPP structuring, in Europe, North America, and the Middle East.

Malak Draz is an Investment Analyst with IFC Advisory Services in Public-Private Partnerships and is based in Cairo. Before joining IFC, Malak worked in the financial, construction, and insurance sectors in Egypt, Spain, and Mexico.

Approved by Moazzam Mekan, Manager, IFC Advisory Services in Public-Private Partnerships.



Helping Small Water Utilities Become Bankable

Small water utilities with fewer than 5,000 connections compose over 90 percent of the known network systems in urban areas in the Philippines. By developing their capacity to improve performance, these small operations increase the likelihood of being considered creditworthy and bankable so they can finance investments for expansion and service improvements. The Small Water Utilities Improvement and Financing (SWIF) Project of the World Bank's Water and Sanitation Program¹ (WSP) in the Philippines worked with 11 small water utilities to help them with strategic planning and performance improvement plans, preparation of cost recovery tariffs and project proposals that can be submitted to a bank, and reorganization of their investment plans to suit available financing. This SmartLesson shares the project team's experience in helping these small water utilities become bankable.

BACKGROUND

As of 2008, 91 percent of Filipinos had access to improved drinking water, making the Millennium Development Goals target of 92 percent seem almost attainable. But, with a high urban growth rate of nearly 2 percent, it will not happen easily. Small utilities face the challenge of starting from a low number of connections, and to catch up with rapid urbanization they need to implement successive investment plans that are suited to their financing and management capacity.

A 2004 World Bank WSP project of benchmarking water utilities revealed that small water utilities fund their capital expenditures mostly by internal cash generation and grants that can fund only minor investments. These utilities have difficulty borrowing from banks, because they are afraid to borrow or because they have no experience in borrowing. They do not know how to prepare a project proposal, nor do

they have collateral that can be used to guarantee their loans. They also find the available bank loan terms in the market—with a short repayment period and high interest rate—to be a challenge to their cash flow.

The small utility's management and staff need internal tools to conceptualize, finance, and manage investments and changes continually. The SWIF Project of the WSP in the Philippines had to devise an improvement planning system driven by the utility, rather than externally through a project or through consultants.

The SWIF Project worked with 11 small water utilities to help them identify and develop potential projects, linked to their performance improvement action plan,² that will require financing and to provide an opportunity for hands-on training of utility staff in project finance, planning, and decision making. The

¹ The Water and Sanitation Program (www.wsp.org) is a multi-donor partnership administered by the World Bank to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services.

²A performance improvement action plan concerns an area of operations (for example, reducing leakages, improving water quality, or increasing service coverage) that needs to be managed to improve its efficiency and effectiveness, including how this improvement will be accomplished, who will be responsible for it, and expenditures and investments that may be needed to effect these changes.

SWIF Project, implemented from July 2006 to March 2008, helped the utilities improve their performance to enhance their creditworthiness and improve their capacity to prepare project proposals that can be submitted to a bank.

The project helped refine and update the recommended tariff model of the government's National Water Resources Board for water utilities that it regulates. The utilities used this model as a tool to consolidate their business plans for a five-year period and to see the financial results of their targets.

The project also developed a guide to ring-fencing³ water operations for local government-run water utilities and prepared a performance improvement toolkit for small water utilities by documenting and compiling the process of coaching them. For example, the toolkit describes the coaching of the water utility board of directors and staff in strategic planning through the SWOT (strengths, weaknesses, opportunities, and threats) analysis, along with steps for preparing performance improvement plans. Familiarization with the financial projections model and explanations on tariff setting are also documented.

During strategic planning, the participating utilities recognized the need to expand their services while improving their performance, so they could reach more people and give them access to piped water. The top investments they planned were for the expansion, upgrading, and rehabilitation of their networks and water-source development. They also planned commercial systems improvements, such as the computerization of their billing and collection system, to be funded mostly by internal cash generation after implementing a cost recovery tariff.

³ Ring-fencing of accounts involves the isolation of water operations from the other activities of the local government so as to generate reliable financial reports showing the true performance of the water utility, generate information that can be used to determine the appropriate tariff, and build a financially viable and self-sustaining water utility.

All of the utilities received assistance with formulating project loan proposals out of their investment plans. Of the 11 utilities, 4 planned to borrow, 1 has already obtained a loan for source development, and 1 is in the process of completing the bank's requirements.

Table 1 shows the overall results of the utilities' performance from 2007, just before the project was completed, to 2009, the latest data. New connections enabled piped water to reach 10,250 persons. However, profitability weakened because some of the water utilities could not implement their cost recovery tariff. This is indicated by the operating ratio (the ratio between operating expenses and operating revenues). The collection period improved the most because of improvements in the utilities' billing and collection systems, including disconnection of delinquent accounts. Nonrevenue water (the portion of water production that is not billed or sold) went up slightly as a result of better measurement of actual production.

LESSONS LEARNED

Lesson 1: Involve everybody in the utility in the training, and the small water utility will be more resilient.

The 11 participating water utilities average only 14 staff each and have very simple organizational structures. The project encouraged everyone in the water utility—from board directors to clerks to plumbers—to participate in the training, which used a participatory and coaching approach.

The training started with a three-day workshop on the water utility's premises. The first day was devoted to strategic planning using the SWOT analysis, and board members were invited to attend. Topics on the second day covered how to prepare a project proposal, how banks evaluate a proposal, and what data are needed to prepare one. This was followed by discussions on an ideal organizational setup for a

Table 1: Selected Performance Indicators, 2007 and 2009

INDICATORS	2007	2009
No. of connections	29,143	31,008
Operating ratio	0.79	0.82
Collection period, days	109	49
Nonrevenue water	27%	32%

Source: Water Utilities Participating in the SWIF Project

water utility, the delineation of responsibilities within the organization, internal controls, monitoring and evaluation, and tariff formulation.

Afterward, the participants were segregated into technical and financial groups. The technical group discussed water sources, transmission, storage, and distribution issues; water quality and water treatment; the demand and supply gap; and the costing of capital and operating expenditures. They were guided on how to prepare an investment plan and performance improvement action plan focusing on technical matters such as decreasing nonrevenue water, improving water quality and water pressure, and increasing the number of hours that water is available to consumers.

Meanwhile, the financial group prepared its performance improvement plans related to financial matters, such as how to improve their billing and collection system so as to shorten their collection period. The training also offered hands-on exercises on financial projections, gathering the assumptions and data needed (including the technical information to be provided by the technical group), where they come from, how they are entered into the projections, how to analyze the results, and how to revise the projections to achieve the desired goals. Then everybody joined in the presentation of the financial projections and reviewed the results of their initial plans to assess whether they were doable or overly optimistic. They

learned how to revise their assumptions until they were satisfied with the results.

To give utilities confidence in their plans, a customer survey was conducted to confirm that the plans match the priorities of customers and to reveal how much tariff increase their customers can tolerate.

The SWIF team left the utility to improve on its investment plans and performance improvement plans and to draft its project proposals. These were later submitted to the SWIF team for review and comments.

During a subsequent visit, one water utility changed the proposal it submitted at the end of the project, because a big supermarket chain planned to open a branch within its service area and a real estate subdivision donated its network to the water utility. The head of the technical department could confidently explain how the utility would meet the additional demand from this supermarket and the additional connections. Even the human resources head understood the impact of this additional demand on the utility's operations. The general manager and chairman of the board knew how much financing they would need for these changes.

A team included a technical and financial consultant, reinforced by counterparts from national government agencies (the Local Water Utilities Administration, the Department of the Interior and Local Government,



Small water utilities with fewer than 5000 connections compose over 90 percent of network systems in urban areas of the Philippines.

the Cooperative Development Authority, and the National Water Resources Board).

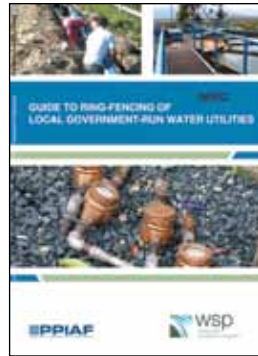
As a follow-up, an accreditation project is being developed whereby technical service providers will be accredited by the economic regulator of water utilities, the National Water Resources Board. These accredited consultants can be engaged by water utilities to help them with their performance improvement and with compliance with regulation requirements. Utilities may obtain a loan from a revolving fund to pay for the services of the accredited consultants.

Lesson 2: Ring-fence the accounts of water operations.

In the Philippines, the operations of water utilities managed by the local government are not ring-fenced, and thus the utilities' performance cannot be measured accurately. To address this issue, the project developed the "Guide to Ring-fencing of Local Government-Run Water Utilities," showing the steps needed to identify all revenues related to water operations and how to record them for the water utility. Before ring-fencing, it was not easy to know how many water bills were collected and who had not yet paid them.

The guide also shows how to identify and record expenses incurred by the other local government departments for water operations and to record

them to come up with more accurate financial statements for the water utility. This involved developing the staffing system for the water operations and agreeing on rules on attribution of shared resources. Before ring-fencing, for example, the salary of the municipal engineer, who also heads the water utility, was charged in full to the Municipal Engineering Department and none of it was charged to water operations. With ring-fencing, his salary is now prorated between the Engineering Department and water operations. By ring-fencing the accounts of water operations, the municipality is now able to know how much subsidy it is giving the water utility, and it has a more accurate basis on which to calculate the proper tariff to charge consumers.



One mayor did not realize until the water operations were ring-fenced that the utility was giving a lot of subsidies for providing water to just a limited portion of its constituents. Now that the mayor is getting a more accurate figure of the actual costs, he is working toward implementing a cost recovery tariff.

The United States Agency for International Development has collaborated with WSP-Philippines and the Department of the Interior and Local Government, as well as the Cooperative Development Authority, to help more utilities ring-fence their water operations. So far, five local government-managed utilities and three water cooperatives have shifted to ring-fencing the accounts of their water operations. Another five local government water utilities are currently working on their ring-fencing.

Lesson 3: Address the special financing needs of small water utilities by dealing with the gap between what utilities want and what banks want.


It does not always follow that when a water utility is creditworthy and bankable it can easily obtain a loan from private banks. In the early stage of the project, banks expressed interest in lending to water utilities. But when the project proposals were ready, banks found that the risk-return profile of small water utilities does not make them a prime market for commercial banks.

Another factor is the availability of grant funding through the congressmen's countryside development funds. Utilities would rather seek these funds than to go to banks. One solution may be to use these grants and development funds to leverage commercial funding.

Four of the project's eleven participating utilities initially planned to obtain a loan. So far, only one has actually borrowed, to fund the drilling of a new well to augment its water source. It is a local government-managed water utility whose collateral is the internal revenue allotment of the municipality from the central government. A rural water supply association is also working on complying with the bank requirements for a loan to fund a new well. It took some time for the association to decide to borrow from a bank, which offers a short repayment period and high interest rates. A water cooperative that wanted to expand its coverage was fortunate to obtain grant financing from the local government and the countryside development fund of the congressman in its town, so it does not have to borrow for now. The fourth utility, also a cooperative, is still working to get approval of its much-needed tariff increase before it can also borrow for service expansion.

A 2008 study, "Small Utility Access to Market Credit: Lessons and Options," done under the SWIF Project, cites the differences between what utilities and banks

Table 2: What Water Utilities and Banks Want

Utilities Want		Banks Wants
<ul style="list-style-type: none"> • Longer tenors matched to asset life • Fixed interest rates to manage fluctuations in tariffs • Smaller loan amounts; multiple drawdowns • No real estate mortgage collaterals • Assistance for investment planning and project development 		<ul style="list-style-type: none"> • Tenors matched to liabilities (sources of funds) • Floating interest rates matched to market price, variable discount rates and reserve requirements • Adequate spreads and economic size • Low credit risk • Investment proposals that breed confidence

Source: Small Utility Access to Market Credit: Lessons and Options, Water and Sanitation Program

want, as summarized in Table 2. The gap between these wants has to be addressed so utilities can access funds from the market to improve and expand their operations.

WSP-Philippines is conducting a study that will develop options and strategies on lending transactions between rural/thrift banks and small water service providers, using the wholesale facility of the Development Bank of the Philippines that will be established under the World Bank-supported Regional Infrastructure for Growth Project.

CONCLUSION

Small water utilities are important. They represent over 90 percent of all piped water operators in the Philippines. They provide water to areas that the big operators are not serving. But they have specific challenges. They need to manage continual growth despite the disadvantage of having a small customer and financing base. The support to them needs to be very tailored and focused on transferring capacity to

the organization that will rely on internal capacities for the coming years. And supporting increased internal capacities requires a focus on internal performance evaluation and improvement planning, support for financial systems and ring-fencing, support for improvement plan development and project development, and linking these with financing.

ABOUT THE AUTHOR

Leila Elvas is a Senior Water and Sanitation Specialist for the Water and Sanitation Program in the Philippines. Prior to joining the WSP, she was a Financial Analyst with the World Bank Office in Jakarta, working on water supply projects in Indonesia.

Approved by Almud Weitz, Regional Team Leader, Water and Sanitation Program, East Asia and the Pacific; Jae So, Manager, Water and Sanitation Program, Washington, D.C.

Designing and Financing a Program from the Ground Up: Lessons from the Uganda Small-Scale Infrastructure Provider Water Program

In 2005, IFC began working with the government of Uganda to improve public-private partnership (PPP) arrangements for piped water supply systems in small towns. The country had been transacting PPPs in peri-urban and rural areas since 2001 and had management contracts with private operators (POs) in 70 small towns, but the contractual arrangements were generally weak and plagued with capacity challenges. Local government authorities were not often familiar with the contract details, which led to an inability to effectively implement details of contracts at both the national and subnational levels. To help the government improve on these flawed PPP models and address issues of weak capacity in the water sector, IFC launched the Small-Scale Infrastructure Provider (SSIP) Water Program. The program succeeded in facilitating access to finance for a PO to develop a piped water supply project in the one town that qualified. This was the first time in the 10-year history of small-town water PPP arrangements that a PO in Uganda received a loan from a local bank using the small-town water operations model. IFC also succeeded in convincing the government to extend the duration of management contracts from two or three years to a minimum of five years—a key factor in making these types of transactions more attractive for private operators. It is expected that within the next few years the Ministry of Water and Environment (MWE) will change all management contracts to the newly introduced five-year term. This SmartLesson examines the issue of proper program design, implementation, and financing, and shares lessons learned from the experience of the SSIP Water Program.

BACKGROUND

The idea was to leverage IFC's experience as an advisor for a variety of PPP transactions, particularly water PPPs, and to use the resources within its Financial Markets and Small and Medium Enterprise (SME) departments to address the financing and capacity challenges that existed with private sector participation in Uganda's water sector. IFC originally proposed a program heavily based on capacity-building interventions. (See Box 1.)

The SME Entrepreneurship Development Initiatives (EDI) program and the Financial Markets Department did not sign off on the program's design, mostly because they did not have a clear understanding of the program and their specific roles within it.

A New and Improved Design

IFC worked with the client government, development partners, and private sector participants to create a new program design that was acceptable to all the stakeholders involved. (See Box 2.)

By removing a component that offered interventions for private operators, IFC had an opportunity to collaborate with GTZ, which provided interventions to complement IFC program activities. Successful discussions between IFC and GTZ interested other development partners active in the country's water sector and garnered support for the overall program. IFC was also able to begin to focus on exploring

Box 1: Original Program Design

The original design comprised the following components, in order of priority:

1. Public sector capacity building of local authorities and the Ministry of Water and Environment (MWE) to monitor the operation and management of the water system
2. Private sector capacity building of POs for operational efficiencies and access to finance
3. Transaction structuring and implementation of PPP deals, using international best practices
4. Access-to-finance interventions to encourage local banks to lend to POs, plus development of a product to share the risk of lending to POs between local banks and IFC

Weaknesses:

- Public sector capacity-building activities were not linked to specific transactions or a specific area of capacity.
- Private sector capacity building was not necessary, because the German Technical Corporation (GTZ) was already providing similar interventions.
- Not enough pre-implementation studies were done on current financing options available to POs and on the willingness and capacity of local banks to lend to them. And, the merits and feasibility of a risk-sharing product were not clear.

Box 2: Revised Program Design

The revised program includes some of the original components:

1. Transaction structuring and implementation of PPP arrangements
2. Public sector capacity building linked to transactions and to key deliverables
3. Access-to-finance interventions focused on specific transactions and on improving the willingness and capacity of banks to lend to POs

Benefits:

The first component—the program’s core—covers 10 small towns and includes due diligence followed by a recommendation that the government adopt one or more options for water PPP arrangements. The outcome of this component will be model PPP contracts that will be adopted by the entire water sector.

The component for planned public sector capacity building will involve interventions on contract administration for local authorities and the MWE, using the model contracts as case studies. The interventions will cover key aspects of the contract.



Women fetching water at a public water pipe (PWP). The PWP is installed over a borehole and households pay nominal fees to fetch water from this source.

avenues to provide financing for one or more of the estimated 15 private operators in the water sector.

LESSONS LEARNED

Lesson 1: Take on no more than necessary.

When designing programs, we need to understand our delivery capacity—and recognize our limitations. In Uganda, POs are primarily small and medium enterprises beset by such problems as weak accounting and reporting systems, lack of training for employees, and no thorough strategic thinking for operations or expansion. But many partners fund and assist a

variety of development activities in the water sector. For the past few years, for example, GTZ has helped the Association of Private Water Operators strengthen its members' capacity to improve their operational and business efficiencies.

Lesson 2: Offer strategically aligned complementary advisory services.

The original proposal centered on a fairly broad public sector capacity-building component that lacked focus. After four to six months of conducting a needs-assessment survey to ascertain the areas of capacity that needed attention, we found that the

MWE and other development partners were already attempting to improve many areas of capacity. But the stakeholders still could not properly administer and manage PPP contracts.

Capacity-building interventions will now focus solely on the administration of the model PPP contracts proposed by IFC for the planned transactions.

Lesson 3: Engage and communicate!

IFC did not sufficiently engage with development partners, the government, and stakeholders during the program's design phase. For example, the original design's private sector capacity-building component significantly delayed proposal approval. In the end, IFC removed that component and agreed to have GTZ take ownership of capacity interventions for the private sector.

With the MWE's assistance, IFC could have identified development partners to take on other aspects of the program, such as access to finance and public sector capacity building, while IFC focused on its core competency.

Lesson 4: Determine whether subsidies are required; if so, be sure they are available prior to structuring the transactions.

MWE had impressed upon IFC that the “need for zero subsidy” was one of its criteria for selecting the towns. However, after the site visits and due diligence, it was clear that subsidies were required for all 10 towns. Unfortunately, Global Partnership on Output-Based Aid (GPOBA) subsidy funds were sufficient to cover only one of them. To maintain continuity within program activities and to ensure demonstrable effects, the project went ahead and implemented a bid for that town.

Prior to signing up to provide advice for PPP transactions in any of the project towns, IFC should have requested written confirmation from MWE on

the source and amount of available subsidies for the planned transactions.

Lesson 5: Help with capacity building of the various players.

IFC assisted the government with building the capacity of local water authorities—as well as POs and MWE staff—to administer the PPP contracts. The objective was to increase the participants' understanding of the PPP contracts, thereby improving the local authorities' management of PPPs and the POs' delivery of service.

An initial needs assessment revealed a low level of understanding of PPP contracts. Although several water boards in the country have been involved in performance contracts and management contracts for up to a decade, most board members lack an adequate understanding of the rationale for these arrangements and the mechanisms for managing and monitoring them. Also, many small-town water systems have had conflicts between the board and the PO. It has been a challenge to manage these ongoing tensions and conflicts effectively.

We held two successful training workshops for two groups of participants, with participants in each workshop representing the three main stakeholder groups: 1) local Water Supply and Sanitation Boards, 2) POs, and 3) the MWE. Respondents found the role-playing and hands-on problem-solving aspects potentially useful to their day-to-day management of PPP contracts.

Lesson 6: Work with local banks to bring about or improve access to finance for POs.

An assessment of the POs' ability to expand service delivery included an examination of the constraints they faced. IFC found that one of the key constraints is access to finance. During this assessment, interviews with bank personnel yielded many excellent suggestions for how banks can support the POs in the country's water sector.

IFC's comparative advantage in understanding and having a business relationship with financial institutions in the country was a key factor in the project's success. The winning bidder for the PPP was the first private operator to receive financing for working capital from a local bank. Our hope is that this milestone will result in many more such loans being disbursed by local banks toward the development of small-town water projects.

CONCLUSION

The client and the donor are keenly interested in applying the lessons from the program's design and implementation elsewhere. It is now clear that the essential elements of such a program should reflect the core competencies of IFC's Advisory Services in Public-Private Partnerships department and IFC's value addition to such a project. Due to budget constraints, the MWE in Uganda was unable to obtain subsidies for water projects in all 10 towns, so we were able to assist the MWE with a transaction in only a single town. Despite implementing only one transaction in the host country, we believe our work there will significantly assist the MWE with future transactions, and that enhancements to the procurement process and contract terms will make these transactions more attractive to POs and lenders. Through our capacity-building work, key government officials are better equipped to manage contracts with POs, ensuring that these transactions are sustainable. And our access-to-finance work helped introduce commercial lenders into this sector—a significant outcome, which we hope will result in the expansion of the country's small-town water program with the assistance of local banks.

ABOUT THE AUTHORS

Frances "Sese" Gadzekpo is an Operations Officer with the Sustainable Business Advisory Department. She is responsible for the Infrastructure Product Line, focusing on water. Prior to joining IFC, Sese was a business development consultant for Millicom International Cellular, Marubeni Corporation, and Enron.

David Bot Ba Njock is an Investment Officer with IFC Advisory Services in Public-Private Partnerships.

Carla Faustino Coelho is an Investment Officer with IFC Advisory Services in Public-Private Partnerships.

Approving Manager: Emmanuel Nyirinkindi, Manager, IFC Advisory Services in Public-Private Partnerships, Africa.



Dealing with Informality in Water Supply Services in Indonesia

Communities demand that community-based organizations (CBOs) be more professional in their delivery of water and provide the level of service they expect. This demand may present a challenge, due not only to the limited internal capacity of the CBO but also to the uncertainty as to the legal status of the organization that performs the service function. If policymakers and local authorities want CBOs to perform better, particularly in rural areas, they need to strengthen corporate practice and work toward improving formalization, accountability, and partnership definition. This SmartLesson describes the Multi-Village Pooling Project's experience with the challenges and potential of CBOs formed under previous projects, and it identifies ways to help them improve, expand, and manage on a continuing basis.

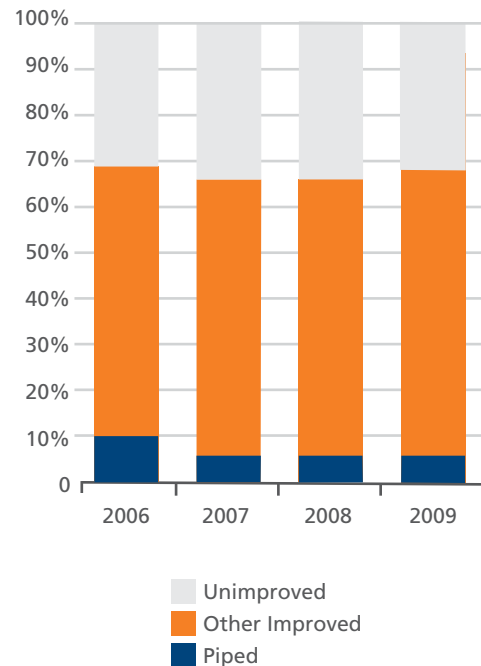
BACKGROUND

Indonesia's more than 70,000 villages are spread across 491 districts and municipalities in 33 provinces. Fifty-six percent of the country is rural, and 52 percent of the population depends on shallow wells for their water. According to WHO-UNICEF¹ Joint Monitoring Program data (2008), overall access to water is 80 percent, but with a disparity between urban (90 percent access) and rural (70 percent access) areas. (See the chart.)

To improve services, over the past two decades, the government has built no fewer than 10,000 water supply facilities in villages with World Bank funds alone. These facilities are managed by CBOs. The number is even larger if facilities built using national budget funds, other donor funds, and social funds from corporations are taken into account.

This increased investment in CBO-managed facilities is due not only to the internal benefits of a community-based approach—such as strong sense of ownership, community contribution to the project,

Rural Water Supply Access



Source: Badan Pusat Statistik, SUSENAS

¹ WHO (World Health Organization of the United Nations); UNICEF (United Nations Children's Fund).

involvement of the community in the operation and maintenance of facilities, and so on—but also to the poor performance of local water utilities.

Learning from previous projects, the project improved the design of the implementation of community-based investment projects to ensure the sustainability of the facilities. Preparation focused not only on achieving good-quality construction, but also on social preparations in anticipation of changes in roles and functions in the existing community structure as the result of having a new institution manage the facilities. The project adopted a demand-responsive approach to ensure that the project targeted those who actually wanted water supply services, and it required cash and in-kind contributions from the community during the construction of the facility, as an indicator of demand for the project.

As a result of this approach and of communities' continued need for water supply services, the role of community groups in service provision is growing. A 2008–2009 study by the World Bank-administered Water and Sanitation Program (in five districts in two provinces in Indonesia)² found that existing CBOs cater to an average of 1,200 users (260 connections), which means that the CBOs in these five districts are delivering water to an estimated 800,000 people (about 7 percent of the total population). Data from Blitar and Lamongan, two of the districts, show that CBOs provide between three and five times more household connections than do the local water utilities. Approximately 67 percent of the CBOs surveyed have operating ratios of less than 1, which means that each has a borrowing capacity of between IDR 12 million (\$1,100) and IDR 400 million (\$44,000). CBOs also manage assets worth, on average, \$50,000.

Focusing on users' and potential users' willingness to pay, the study found that those willing to pay more for services would be prepared to pay 30–300 percent

more than the tariffs currently charged by the CBOs.³ This high willingness to pay is very likely driven by customers' desire for better service. More than 60 percent of respondents noted problems with their current service, such as insufficient water pressure or reliability, while the hypothetical willingness-to-pay scenario offered good pressure and reliability.

These two findings indicate that there is opportunity to expand the role of CBOs in delivery of water supply services. Although several experienced CBOs have expanded their services and operations since the initial investment was made, leveraging their role in community water supply presents even further challenges related to their internal institutional capacity and to external, structural issues such as clarity regarding their mandate and relationship with the government.

LESSONS LEARNED

Lesson 1: Build CBOs' capacity for corporate practices.

CBOs were originally designed as organizations “from the community, by the community, and for the community,” financed by a project. When projects ended, some performed poorly and folded; others managed to maintain improvements in both performance and services. For those CBOs that were able to survive and expand their services, there has been a shift in their community-based nature and structure. For example, their customer base may now expand beyond those involved in setting up the CBO to include people who did not contribute in cash or in kind when the project was under way, and in some cases do not even live in the administrative territory of the village for which the service was originally intended. The implication of these developments is that not all users have the same rights and responsibilities. For example, the greater the number of users, the greater

2 Malang, Lamongan, and Blitar districts in East Java province, and Bandung and Cianjur districts in West Java province.

3 This study used a contingent valuation, with respondents being asked how much they would be willing to pay, contingent on specific hypothetical scenarios.

the delegation of functions from the community to the CBO. Although not officially documented, there is evidence that community participation in strategic decision making has been delegated to the CBO. Users are more concerned with getting decent service at an affordable price. Over and above that, decisions lie with the CBO.

Unfortunately, the majority of CBOs do not adopt corporate practices. They do not have systems in place to plan and budget on an annual basis, are not externally controlled for performance, have no incentives for staff, and have no systems for financial reporting and asset recording. Public meetings to report on performance to the community are now rare. This leaves the door open for discord between users and the management board and results in a lack of protection instruments for all sides, including CBO control and accountability mechanisms.

Capacity-building programs need to be conducted to improve the CBOs' current organizational charters on people, process, and practices. On people, one area to be improved by CBOs relates to how the committee is structured. CBOs should provide people with clarity as to their rights and obligations, agree on eligibility criteria to become a committee member, and agree on who makes what decisions. On process, the CBOs should define clear objectives for the organization, including its scope, values, and principles, and their governance over committee and community members, including financial policy on what is done with the profit. On practices, CBOs need to develop policies for customer relations tariff-setting mechanisms, and evaluation from external parties, including conflict resolution.

Lesson 2: Work toward formalization.

In addition to empowering communities, the community-driven development approach also breaks through the bureaucracy that in the past has delayed and blocked the flow of assistance to communities.

In adopting this approach, CBOs tend to sidestep to some degree the functions and mechanisms of agencies of the bureaucracy, such as village and district government offices. Instead, they receive technical assistance, provided by teams of consultants and facilitators, for the operational functions of project implementation. Although this approach is good at quickly and effectively reaching the community with facilities, organizations formed when the project was under way become fragile when the project ends.

For project-formed organizations, which offer limited support when the project is ongoing, it takes time and adjustment to local challenges to evolve into established organizations. All too often, the fate of the organization depends on a handful of individuals who enjoy very high social and economic standing in the village. This makes the foundation of the organization very fragile. For example, local political power can be so strong that CBO managers may be replaced (supplanted) for not doing as the local political power would like or, alternatively, can hold their positions "forever," regardless of their performance in managing the facilities.

In addition, guidance from the local authority is weak. In such cases, it is not clear who controls the managers' performance or to whom they report. In the long run, it is the users—those who have made contributions and who want better services—who will lose out. And in an even worse scenario, the system will fold, resulting in a loss on an investment that was financed by public and private funds.

Many CBOs are aware of the fragility of their position as organizations with no legal status. They expressed interest in becoming registered, legal entities. To do this, they had to revise their articles of association and bylaws and discuss with the community concerned what kind of legal entity they should become. Becoming legal entities separates the individual responsibilities of the managers from the responsibilities of the organization in formal dealings with other institutions. It is not uncommon for

managers to borrow funds against personal collateral to keep operations going—for example, to replace a burned-out pump or to pay the electricity bill if there is not enough money collected from the customers. Not being a legal entity poses risks to the individual rather than to the organization.

Being a legal entity helps the community appreciate and consistently apply the agreements—made in the organization’s articles of association or bylaws—that define the tasks, roles, and responsibilities of each stakeholder group.

Lesson 3: Develop an accountability framework between local government and CBOs.

In some districts, CBOs receive little support from the district government, even though the number of piped water users catered to by the CBOs exceeds the number of users served by local water utilities and, in general, the level of welfare of CBO customers is lower than that of local water utility customers. Local water utilities get additional investment funding every year, receive advice, and have the backing of public policy to run their operations, but there is no framework of district government support for CBOs, perhaps due to uncertain relations between the two. Regulations say that the water supply function is the right and responsibility of government. Thus, CBOs exist to assist government in executing its function and role in water supply provision.

Furthermore, in many cases, CBOs take on a greater load than do local water utilities. For example, CBOs pay commercial rates for electricity, because they use large-capacity distribution pumps. Commercial rates for electricity are higher than industrial and residential rates. CBOs also pay higher water land rates than do local water utilities. Also, local governments do not offer much help in resolving disputes or misunderstandings between CBO managers and users or village leaders.

As the authority responsible for the implementation of water supply services, local governments need to assume a greater role in managing services, including:

- Issuing mandates and licenses to CBOs to provide services in specified areas that include all the service performance criteria that have to be met within a realistic time frame.
- Reviewing and revising any onerous regulations on community-based water management organizations, and developing local regulations that provide legal certainty for implementation of water supply services by CBOs.
- Providing opportunities for public-private service partnerships on a realistic scale through competitive tenders to ensure efficient services.

Lesson 4: Define a form of partnership between local government and the CBOs.

Generally, assets used for development of water supply infrastructure are recorded as capital expenditures in government accounting systems. Unlike social expenditures, where assets are transferred (such as contributions to disaster-struck communities), capital expenditures must be recorded as government-owned assets. This makes the organization of assets complicated in practice. There are consequences not only for asset recording, but also for when there are returns on government-owned assets that are managed by CBOs. Although there is no evidence of this happening, some people in government believe that revenues arising from the management of government assets belong to the government and belong in the state treasury.

This problem is further complicated for the following reasons:

- The message given to communities at the time of the initial project investment is that the facilities built will belong to them and that they should be maintained and used accordingly.
- The community contributes to the construction of the facility, both in cash and in kind. So these

assets are actually jointly owned, though not in equal proportion.

- When facilities are developed, beyond revenues arising from the management of the facilities, users often make additional contributions to get better service, such as purchasing pipes to get household connections, purchasing water meters, adding reservoirs, and purchasing higher-capacity pumps.
- CBO personnel are not paid market wages. Most managers are volunteers who are paid below the regional minimum wage.

Although the assets initially invested through project funds will depreciate and at some point will cease to have any value, current assets (which have been replaced) are the result of the management of the CBO. In practice, this will be a concern for the CBO.

As an example of what happens as a result of this vague and impractical system of asset management, selling a burned-out, unusable pump (originally purchased with government funds) and replacing it with a new pump breaches audit regulations (because the broken pump should have been saved). Total compliance with audit principles is not only impractical, but also difficult for communities to understand.

Transferring government assets to CBOs is no easy option, either, given the requirement for approval from numerous authorities (including regional government, the Ministry of Public Works, and the Ministry of Finance) and the questionable reliability of the process.

Considering that full privatization, where all right and authority of service are in private hands, is not possible by law, and full public management is not a wanted choice, some possible action to solve this problem might be through developing appropriate partnership forms between CBOs and local governments in water supply service. The following are some possible forms of this delegated or partnership model:

- A management contract where CBOs are responsible only for operation and maintenance of the system;
- A concession where CBOs also invest in expansion in addition to operation and maintenance; and
- A joint venture where CBOs also invest in equity in addition to their role in operating and maintaining the system; hence, the CBOs act as a private entity.

In fact, these partnerships are happening, but there is a lack of formalization, so it is difficult to trace performance accountability for both sides. Formalization will educate both parties about how to bargain their role sharing in the partnership and how to achieve better planning for both sides, since CBOs will be aware of their obligations regarding incentives, and this will trigger the local government to better monitor the service performance.

CONCLUSION

Although community-based water supply organizations are the preferred option, at a certain scale, managing water supply facilities solely on the principles of community-driven development is difficult, given the pragmatic nature of communities and their focus on service. The current trend is toward communities as paying consumers who demand affordable services, rather than communities who want to collectively think of ways to improve services. Greater value is placed on roles, and more is expected of those given roles within the community structure.

ABOUT THE AUTHOR

Deviariandy Setiawan is a Community Development Specialist in the World Bank Jakarta office, where he is Team Leader for the Multi-Village Pooling Project. Devi has an engineering and social development background and has worked primarily in rural water and sanitation development.

Approved by Jae So, Manager, Water and Sanitation Program.



Water Footprint: A Tool for Unleashing Corporate Water Stewardship

By 2030, according to projections, one-third of the world's population (concentrated in developing countries) will live in areas where water demand is estimated to outstrip supply by 40–50 percent or more. It may be a challenge for businesses to thrive in an era of such water scarcity. One tool that can help is a water footprint assessment—a framework through which a business, an industry sector, or a group of businesses in a watershed can evaluate and address water risks and impacts. This SmartLesson provides an overview of a water footprint assessment, including a description of IFC's water footprint assessment with Jain Irrigation Systems Limited.

BACKGROUND

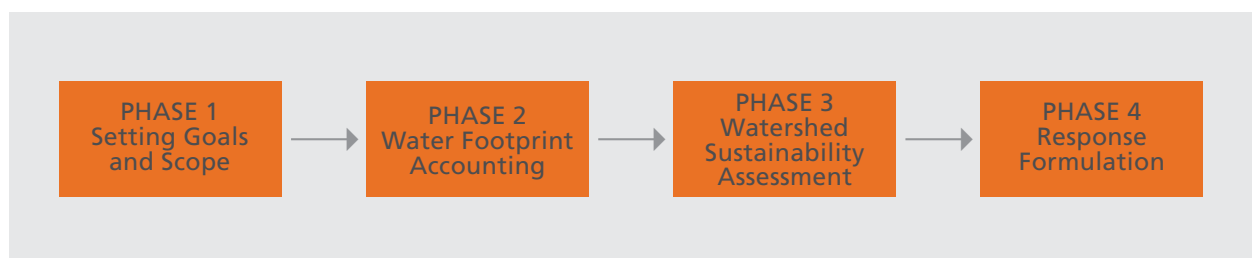
Water footprinting is a young practice, supported by the Water Footprint Network.¹ A corporate water footprint assessment consists of four phases (see Figure 1):

- **Phase 1** sets goals and defines the scope of the assessment.
- **Phase 2**, water footprint accounting, considers water consumption in the supply chain as well as in operations; distinguishes between green water (rain water), blue water (surface and ground water),

and grey water (an indicator of water pollution); and specifies the water source(s) and the timing of water consumption (important where there are seasonal variations in water availability).

- **Phase 3**, sustainability assessment, considers the overall sustainability of the watershed, which will be of interest to other actors in the watershed and can form the basis for a stakeholder dialogue on water resource management.
- **Phase 4**, response formulation, draws upon the water inventory and sustainability assessment to pinpoint opportunities for a business to address water risks and impacts. Response strategies can include working with IFC to finance water efficiency measures in operations and in the supply chain, community engagement, participation in public-private dialogues, watershed restoration, and other measures.

¹ The Water Footprint Network (www.waterfootprint.org) was founded in 2008 with IFC as a founding partner. It has more than 130 partners worldwide from business, academia, nongovernmental organizations, and the public sector. Partners include such organizations as the Nature Conservancy, the World Wildlife Fund, the World Business Council for Sustainable Development, the Coca Cola Company, Unilever, Nestlé, Lafarge, and Jain Irrigation.



Source: Water Footprint Manual, WFN 2009

Figure 1: The four phases of a water footprint

ADDED VALUE OF A WATER FOOTPRINT ASSESSMENT

Traditionally, the measurement of corporate water consumption has been expressed only in cubic meters (no location or seasonal information) and has looked only at operations (not the supply chain). This type of information is not rich enough to allow a business to truly assess the impacts and risks related to its water consumption and to devise a response strategy.

The impacts of freshwater use and exposure to water risk are intrinsically linked to a location (the watershed) and to the time of year (dry season, rainy season) when it is consumed. Unlike greenhouse gasses, which have the same impact regardless of when and where they are emitted, a cubic meter of water abstracted will have different impacts depending on local water availability and on the water requirements of local people, businesses, and ecosystems. Similarly, water risk also depends on location.

For most businesses, water consumption is much larger in the supply chain than in operations, often exceeding 90 percent. Hence, to fully understand the impacts of its water consumption and its exposure to water risk, a business needs to look down the supply chain at the water consumption of product inputs.

ADVANTAGES OF WATER FOOTPRINT ASSESSMENTS

Much of the impact of climate change will be felt in the water supply through changes in rainfall patterns, increased droughts and floods, saltwater intrusion into groundwater, and increased agriculture and livestock water needs in a warmer climate. Identifying and addressing water risk can strengthen clients' climate resilience—particularly relevant as IFC seeks to develop new approaches for climate adaptation.

A water footprint assessment can help a company:

- Quantify its own water consumption (operations and supply chains) and understand how it links to local watersheds and what the associated risks are.

- Understand the characteristics of watersheds of concern—the underlying hydrology and the drivers, outlook, and social and environmental implications of water scarcity—to enable the company to take effective action for risk mitigation.
- Devise comprehensive strategies for reducing the impacts of water consumption and exposure to water risk.
- Play a leadership role in addressing water scarcity at basin level.

The assessment also creates a rigorous baseline for corporate water consumption, allowing a company to measure the reduction of its footprint over time; a benchmark to facilitate knowledge sharing and water stewardship within a watershed or industry sector; and a common language for discussing water consumption and impacts among all stakeholders, including civil society, communities, government, and other industry players.

A client is a good candidate for a water footprint assessment when it has the following:

- Local water scarcity concerns or hotspots, in direct operations or among key suppliers.
- Significant water use in operations or supply chain.
- A desire to understand its footprint in order to take action on its own or as part of a regional or sectoral initiative.
- A sponsor willing to dedicate several months of a (near) full-time technical staff to coordinate internal and external data collection.
- A sponsor willing to share costs.
- An enlightened sponsor willing to take on a role in broader water initiatives beyond its own direct operations.

THE JAIN EXPERIENCE

In December 2009, IFC partnered with its client Jain Irrigation Systems Limited to conduct the first water footprint assessment of a developing-country business.

Jain Water Footprint Response Strategy

The Jain water footprint response strategy consists of four complementary approaches to alleviating water scarcity and improving the sustainability of water use:

- ***Specific groundwater consumption.*** Through supporting increased use of drip irrigation by existing onion farmers, Jain can help these farmers reduce their water consumption and thereby alleviate local groundwater overdraft.
- ***Overall groundwater consumption.*** Looking more broadly at agriculture in the Jalgaon growing region, Jain can also support the government’s push for new, less water-intensive cropping strategies, which will reduce overall groundwater consumption.
- ***Water supply.*** Jain can increase the amount of groundwater available by encouraging rainwater harvesting and aquifer recharge projects.
- ***Sustainability.*** Jain is considering supporting or establishing a Tapi River Basin Water User’s Dialogue, through which representatives of local water stakeholders can work together toward sustainable water resource management.

This holistic set of measures addresses both water demand and water supply, and includes measures Jain can take on its own as well as ones that involve other actors.

Jain Irrigation is the world’s largest producer of irrigation equipment and second-largest producer of dehydrated onions. This unusual mix of activities allowed us to compare the water footprint of dehydrated onions produced with flood irrigation and drip irrigation and led to an extensive set of response strategies.

We found that onions cultivated under drip irrigation have a 42 percent smaller footprint overall, compared to onions cultivated under flood irrigation, and that the gray water footprint for drip is almost 90 percent smaller. In other words, drip irrigation significantly improved “crop per drop” and decreased water pollution associated with surface runoff and groundwater leaching.

Although onion crops in Jain’s supply chain account for only 1 percent of total water consumption in the local watershed, they are still vulnerable to water shortages. Therefore, the response strategies developed are a holistic mix of measures to increase water supply and reduce water demand. Some are initiatives that

Jain can take on its own; others involve cooperation with local actors. Overall, the strategies aim to make Jain’s onion farmers more secure and profitable, address water issues at a basin level, and raise Jain’s profile as a leader in addressing water scarcity.

LESSONS LEARNED

Lesson 1: Clarify roles and responsibilities between different partners.

Because water footprinting is an emerging practice, the client will not be familiar with roles and responsibilities. IFC can help make project management effective by explaining from the start how the process is likely to unfold. Typically:

- IFC, the client, and the technical consultant decide on the scope of the water footprint assessment.
- The client is then responsible for collecting all required data, which typically includes water consumption



Jain's drip irrigation systems has allowed 25,000 small farmers to increase output while saving enough water to serve more than 10 million households for a year.

data from operations and from the supply chain, as well as hydrogeological data available from local government offices or universities.

- The client or technical consultant uses the data to calculate the blue, green, and gray water footprint.
- The client or technical consultant assesses the sustainability of the watershed(s) of interest and of the business unit(s) operating in the watershed.
- IFC and the client or technical consultant discuss response strategies to improve the sustainability of the water consumption.

This process currently takes three to nine months and costs \$25,000 to \$150,000, depending on scope and locally available expertise. The cost and duration will be significantly reduced as the Water Footprint Network's WaterFAST software comes on line (first release scheduled for 2011). At a minimum, the client will need to allocate staff to oversee data gathering, gather data from operations

and key suppliers, and review calculations performed by the technical consultant. Responsibilities of the technical consultant and of client staff will need to be clearly delineated. The client should ensure (for example, via a memo from senior management) that staff will have enough time to complete their water footprint tasks apart from their ongoing responsibilities.

Both IFC and the technical consultant should budget for travel, because face-to-face meetings with the client are essential to maintaining a good pace and clear communication.

Lesson 2: Project fundamentals should be sound. To keep the project on time and within budget, maintain a narrow scope.

The original scope included a second product (mango puree), but as our deadline drew near, we realized that

we would not be able to gather the required data in a timely manner. Because the mango supply chain was geographically dispersed, we would need to collect a full data set from each mango growing area. In the end, we realized that it would have been more efficient to keep a narrow focus from the start.

Lesson 3: Go with the best expertise at hand.

The Jain water footprint assessment was successful, because the expert team was strong and the client was committed. The team was selected because they were conducting similar work for Coca-Cola (orange juice footprint in Florida and Brazil) and thus were familiar with the very nascent methodology and challenges. Also, the lead consulting firm (LimnoTech) was committed to furthering knowledge in the field of water footprinting and agreed to contribute more than \$10,000 in staff time to complete and present the report when we ran out of budget, thus de facto becoming a cosponsor.

The Jain water footprint assessment is thorough, scientifically sound, well-documented, and easily accessible. It now serves as an excellent showcase to illustrate to other (nonmultinational) companies what water footprinting can mean to them.

Lesson 4: Create a solid communication strategy from the outset.

Initially, we focused only on the external communication of the project by means of a report to be presented in September 2010 at the Stockholm World Water Week, the renowned annual global water event. This event—an opportunity for broad dissemination and impact of the study—became our deadline. Then we had another opportunity to communicate what we had learned, during an internal WaterNet event at IFC in October 2010, when Jain's management was in Washington to receive the IFC Client Leadership Award 2010.

Later, as the team worked to capture the Jain experience for internal communication, we realized that we needed additional communication tools to convey the results from the Jain pilot and to manage expectations regarding further deployment of water footprint assessments with clients. It would have been better to create a solid communication strategy for both internal and external audiences from the outset, or at least in the early stages of the process, with updates throughout and in line with results.

CONCLUSION

Think boldly. Aim high. For the foreseeable future, any water footprint assessment will probably be groundbreaking in some way. The response strategies in a water footprint assessment can set the stage for further advisory or investment services. For example, a water footprint assessment can be applied at a basin level as a prelude to community engagement, enhancing drip technology in the supply chain, and multistakeholder engagement or public-private dialogue. A water footprint assessment can also be applied by a group of businesses in a given sector or watershed to benchmark and then collectively raise the bar on water performance.

ABOUT THE AUTHOR

Sabrina Birner is a consultant to IFC, working on water, biodiversity, and energy efficiency.

Remke van Zadelhoff is a consultant to IFC, working on sustainable supply chains and standards.

Bastiaan Mohrmann is Head of IFC's Small and Medium Enterprise Solutions Unit, Sustainable Business Advisory, where he has championed IFC's water footprint advisory involvement. Bastiaan's background is in irrigation engineering and hydrology.

Approved by Bastiaan Mohrmann, Head, SME Solutions Unit, Sustainable Business Advisory.

Credits

PHOTOS

Cover page © Harini Calamur
Page across from index © Yosef Hadar/World Bank
Pages 3, 4, 5 © GPOBA
Pages 9, 11 © Acumen Fund
Pages 17, 18 © Simon Nduyie
Page 21 © Hydroconseil
Pages 23 © Angelo Dell'Atti/IFC
Pages 27, 29, 30 © Monica Tijero Trelles
Page 33 © DFID
Pages 34 © IFC
Page 38 © Md. Firoz Azad Chowdury
Page 40 © Ogandaga
Page 45 © Yann Camus/iStockphoto
Page 47 © Frédéric Vigouroux/iStockphoto
Page 51 © Jean Lapegue/Action Against Hunger
Page 56 © Hydroconseil
Page 59 © Claudia Dewald/iStockphoto
Page 65 © Mo Riza
Page 69 © World Bank

PRINTING

Ecoprint

SmartLessons is a World Bank Group program which enables development practitioners to share lessons learned in development operations. This SmartLessons brochure presents first-hand and straightforward project stories with pragmatic useful analysis, written by professionals for professionals. Through the prism of their own experience—positive and negative—these authors aim to capture practical insights and lessons that could help advance development-related operations for private sector-led growth across the globe.

The **Water and Sanitation Program** is a multidonor partnership administered by the World Bank to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services. For more information, visit <http://www.wsp.org>.

IFC's Advisory Services in Public-Private Partnerships expands access to infrastructure and other basic services such as health and education by helping governments design and implement sustainable public-private partnerships. Our work improves living standards, promotes long-term economic growth, and balances the requirements of investors with public-policy considerations and the needs of the community. Since 1989, IFC has worked on more than 285 private-sector participation transactions worldwide and is the only multilateral institution to offer such advisory services to governments directly. For more information visit: www.ifc.org/ppp.



THE WORLD BANK



IFC | International
Finance Corporation
World Bank Group