

handshake

IFC's quarterly journal on public-private partnerships

- In this issue :
- SMALL-SCALE:** Small water supply systems
 - URBAN WATER:** Water concessions in Colombia
 - IRRIGATION:** Strengthening private sector participation
 - INTERVIEW:** Water Resources Group's Anders Berntell

WATER

ppps



IN PARTNERSHIP WITH

Australia • Austria • Brazil • Canada • Catalonia (Spain) • Flanders (Belgium) • France • Ireland • Italy • Japan • Kuwait • Netherlands • Norway • Sweden • Switzerland • United Kingdom • United States • Public-Private Infrastructure Advisory Facility (PPIAF) • Global Partnership for Output-Based Aid (GPOBA) • Private Infrastructure Development Group (PIDG) • African Development Bank • Asian Development Bank • Brazilian Development Bank (BNDES) • Caribbean Development Bank • Central American Bank for Economic Integration • European Investment Bank • European Bank for Reconstruction and Development • Inter-American Development Bank • Infrastructure Consortium for Africa • Islamic Development Bank

handshake

Issue #1 – Reprinted May 2012

IFC's quarterly journal on public-private partnerships

IFC Advisory Services in Public-Private Partnerships

2121 Pennsylvania Avenue, NW • Washington, D.C. 20433, USA • +1 (202) 458 5326/7 • ifc.org/ppp

Editorial

Tanya Scobie Oliveira • Alison Buckholtz

Art & Design

Jeanine Delay • Victoria Adams-Kotsch

Disclaimer

This journal was commissioned by IFC, a member of the World Bank Group, through its Advisory Services in Public-Private Partnerships department, which helps governments improve access to basic public services through public-private partnerships in infrastructure, health and education.

The conclusions and judgments contained in this report should not be attributed to, and do not necessarily represent the views of, IFC or its Board of Directors or the World Bank or its Executive Directors, or the countries they represent. IFC and the World Bank do not guarantee the accuracy of the data in this publication and accept no responsibility for any consequences of their use.

Letter from IFC

IFC is in the business of improving people's lives. It's not always easy to remember this in the intricate details and complicated logistics of the transactions we advise. Only by humanizing each initiative can we be reminded of our mission. That's where *Handshake* comes in.

Handshake's goal is to show how public-private partnerships can bring practical, innovative solutions to complex global problems like water scarcity, climate change, access to quality healthcare, the complications of urban development, and countless others.

We hope these stories will help stimulate discussion on how we can all help implement sustainable solutions, and we look forward to your feedback.

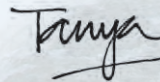


Laurence Carter, Director
IFC Advisory Services in Public-Private Partnerships

As I was reading my two girls *The Water Hole*, a rather unusually insightful children's book, a particular bit of reptilian dialogue made us laugh and think. Nine tortoises are lumbering around an ever-diminishing water hole, looking for a drink, when one says, "Okay, which of you wise guys hid all the water?" Predictably, the ending is a happy one—the tortoises' problem is solved simply when the rains come and the water hole is filled. If only life imitated art.

Handshake, the new quarterly journal from IFC Advisory Services in Public-Private Partnerships, addresses complex real-world problems that are not quite so easily solved. Our first issue, "Water & PPPs" explores the pragmatic and innovative solutions that the public and private sectors create together to tackle the challenge of water scarcity and distribution.

Future issues of *Handshake* will address a wide range of sectors and themes. Throughout, we will give our readers insight into our world—the emerging markets—with readable news and analysis, relatable challenges and solutions, and replicable transaction structures that examine the real people behind the projects: those who benefit and those whose handshakes seal the deal.



Tanya Scobie Oliveira, Editor
IFC Advisory Services in Public-Private Partnerships

Features

21



Small-scale

Small-scale water infrastructure program | 18

Output-based aid | 21

Private small water supply systems | 23

WaterHealth International | 24

Interviews

Thinking outside the bucket | 27

The industry behind the tap | 38

Urban water

Myth vs fact | 30

“Everything became possible” | 32

Bucharest water and sanitation | 34

Manila water | 34

Water concessions in Colombia | 36



In this issue



Irrigation

- Investing in irrigation | 44
- Reinventing rural farming | 48
- First in irrigation PPPs | 50
- Where there's muck there's money | 52
- PPPs in irrigation eLearning | 54
- Piloting progress | 55
- Constructed wetlands | 56
- Small farmers, big dreams | 58

Columns

PERSPECTIVE

Insights & opinions

Water, water everywhere | 06

COMPASS

Surveying the PPP landscape
10 years of water PPPs | 10

MYTHBUSTERS

Setting the record straight
Common misconceptions | 15

MONEY TALKS

Financing & funding PPPs
The death of PFI credits | 25

LEGALEASE

Law & legislation, decoded
Legal & regulatory issues | 43

LAST WORD

Closing thoughts
Thirsting for change | 60

Contributors



Nico Saporiti

is a Senior Investment Officer in Water and Sanitation in IFC's Advisory Services in Public-Private Partnerships department.



Miriam Otoo

is a Post-Doctoral Fellow in the Economics of Resources Recovery at the International Water Management Institute.

Luis Andrés

is a Senior Economist in the World Bank's South Asia Sustainable Development Department.

Jyoti Bisby

is an Infrastructure Finance Analyst and GETPPP Coordinator in the Financial Solutions Department of the World Bank.

Jeff Delmon

is a Senior Infrastructure Specialist in the Financial Solutions Unit of the Finance, Economics and Urban department and the Global Expert Team on PPPs at the World Bank.

Victoria Delmon

is a Senior Counsel in the World Bank Legal Vice Presidency.

Pay Drechsel

is Global Theme Leader and Head of the Resource Recovery & Reuse group at the International Water Management Institute.

Indira Janaki Ekanayake

is a Senior Agriculturist in the Agriculture and Rural Development Unit of the Sustainable Development Network and Task Team Leader of the Zambia Irrigation Development and Support Project at the World Bank.

Clive Harris

is Manager of the World Bank Institute's Public-Private Partnerships practice.

Maggie Haslam

is a freelance writer for the University of Maryland's School of Architecture, Planning and Preservation.

Jane Jamieson

is a Senior Water Specialist in IFC's Advisory Services in Public-Private Partnerships department.

Ella Lazarte

is a Water and Sanitation Specialist at the World Bank's Water and Sanitation Program (WSP), based in Mozambique.

Cledan Mandri-Perrott

is Lead Financial Officer in the Financial Solutions Group of the Finance Economics of the Sustainable Development Vice Presidency of the World Bank.

Philippe Marin

is a Senior Water and Sanitation Specialist for the World Bank's Water Division, Sustainable Development Department, Middle East and North Africa region.

Barnabas Mulenga

is a project coordinator for the Zambian Ministry of Agriculture and Livestock.

Francois Onimus

is Senior Water Resource Specialist at the World Bank.

Edouard Perard

is the Regional Coordinator for South Asia and East Asia and Global Water Coordinator in the Public-Private Infrastructure Advisory Facility (PPIAF) of the World Bank.

Cathy Russell

was formerly a Communications Officer for the Global Partnership on Output-Based Aid (GPOBA), based in Washington, D.C.

John E.H. Ryan

is Senior Researcher-Enterprise Development & Business Model Analysis at the International Water Management Institute.

David Sisen

is a Sector Leader in the World Bank's Sustainable Development Department, Southern Africa.

PERSPECTIVE

WATER, WATER EVERYWHERE

*For the private sector to have a role in solving the water crisis,
it must play a stronger role in agricultural water management.*

By Jane Jamieson



Water, water everywhere/Nor any drop to drink,” wrote Samuel Taylor Coleridge in “The Rime of the Ancient Mariner.” In this 1798 poem, sailors blame the Mariner for the torment of their thirst. Today millions of people around the world face the prospect of “nor any drop to drink”—or to irrigate their land or feed their animals—and it’s our lifestyle that is to blame.

The facts are stark: Water scarcity affects one in three people in the world, forcing people to rely on unsafe sources of drinking water and limiting agricultural production. And yet there is the absurd paradox that millions who lack access to water live in areas where there is plenty of rainfall or freshwater. In other cases, much of this precious commodity—for example, an estimated 50 percent of water used for agriculture—is wasted. Improving the way we conserve, manage, and deliver water is fundamental to solving the water crisis. The private sector has a critical leadership role in this.

WATER & THE PRIVATE SECTOR

The private sector has made significant and lasting contributions to the delivery of reliable, safe water worldwide. By 2007, private water operators were delivering services to around 160 million people in emerging markets. These PPPs have delivered water access to an estimated 24 million people since 1990. Although price increases are often used as an argument against PPPs in the water sector, this is not necessar-

ily borne out by the facts. In a sample of 1,200 water and energy utilities in 71 developing and transition countries, no systematic change in residential prices occurred as a result of PPPs.

Both PPPs and the companies that operate them have evolved to meet the needs of people in the most affected areas. The nature of these partnerships varies widely and builds on the private sector's ability to improve quality and efficiency and to extend access—as well as the government's capacity to raise finance and subsidize expansion to the poor. In 2010, IFC supported the government of Uganda in successfully bidding out the expansion and management of water services for the town of Busembatia to the domestic private sector. The traditional transaction advice provided by IFC was complemented by a range of activities that addressed some of the key challenges faced by the domestic private sector, such as access to credit. This project will help the government facilitate the management of water PPP contracts by developing a generic management contract for use on privately-managed piped water systems that will ensure consistency in contract administration and management.

Part of the solution is also to strengthen the existing operator's ability to expand the availability of safe, clean water at affordable prices. In Kenya, 30 community water providers are accessing finance and improving services through an innovative partnership with K-Rep Bank. Today K-Rep Bank has disbursed over \$1 million to community groups, benefitting nearly 40,000 people. This project brought together a partnership of development organizations committed to expanding services to the poor, including WSP,

PPIAF, and GPOBA. Each organization relied on the other to provide technical assistance and finance.

NEW APPROACHES FOR AGRICULTURE

For the private sector to have a role in solving the water crisis, it must play a stronger role in agricultural water management. Here at IFC, we saw firsthand the success of this approach. Throughout the 1990s, citrus farming in the Guerdane district of Morocco was becoming increasingly unsustainable. The area's 600 citrus farmers were dependent on rapidly falling groundwater and facing increasing pumping costs as the water table fell by two to three meters per year. To address this chronic overexploitation, in 2004 the government of Morocco, supported by IFC, implemented the world's first public-private partnership in the irrigation sector to attract private investment to construct a new irrigation network that would deliver water from an existing dam.

Such a non-traditional PPP model for domestic and agricultural water use is crucial to supporting the development of the water sector in many other developing countries. If well-designed, and implemented by strong and committed public and private partners, these partnerships can have a significant and lasting impact—so that “Nor any drop to drink” may one day echo only in the realm of poetry. 💧



▲ APA Nova provides water to the Municipality of Bucharest in Romania under a PPP.
Photo courtesy of APA Nova.

“The polarization of debate between public and private is unhelpful and lumps together two very diverse sets of actors and agencies on both sides. Each circumstance should be looked at individually and a suitable pro-poor, affordable, and sustainable solution found to fit each context. The decision-making process should be transparent and consultative, involving all relevant parties, to determine how these services will be provided and managed to commonly agreed standards.”

WaterAid International Policy Statement on Private Sector Participation in Water

A young girl with dark hair tied back, wearing a patterned shirt, is drinking water from a public tap stand. She is leaning forward, cupping her hands to catch the water. In the background, other people are visible, including a man in a white tank top and a blue cap, and another person in a blue shirt. The scene is outdoors, likely at a public water supply point.

TEN years OF WATER PPPs

By Edouard Perard

Private-sector participation in water by number of projects has expanded threefold during the last decade. With an average of 50 projects and \$2 to \$3 billion investment commitments per year, 535 water projects benefitting from private participation have reached financial closure during the last ten years. Commitments to water projects with private participation totaled about \$34 billion in that same period of time.

The opening of China to private participation in water infrastructure and its emergence as the first water PPP market among low- and middle-income countries was certainly one of the most important changes of the decade. With 309 projects and \$8.2 billion in investments over the last ten years, China alone accounted for 58 percent of all private water projects by number and 23 percent by investment. In 2009, the last year for which data is available, China accounted for 80 percent of private water projects by number in low and middle-income countries. Most of these projects were potable water and sewage treatment plants (278 since 2000), and were usually implemented under BOT agreements (about 200 of them). In addition, a certain number of

water supply concessions were signed every year (22 in total since 2000). By comparison, other countries in the East Asia and Pacific region signed 22 projects with a total investment of \$9.5 billion.

During the last decade, more than 55 percent of water PPPs were signed by private firms originating from low- and middle-income countries.

Latin America was the second most active region in terms of number of PPPs in water: 113 projects involving investments of \$9.7 billion in 17 countries over the last decade. The PPP activity was concentrated in the first half of the decade with the second half counting three times fewer PPPs implemented than the first one. Most projects were located in Brazil, Colombia, Chile,

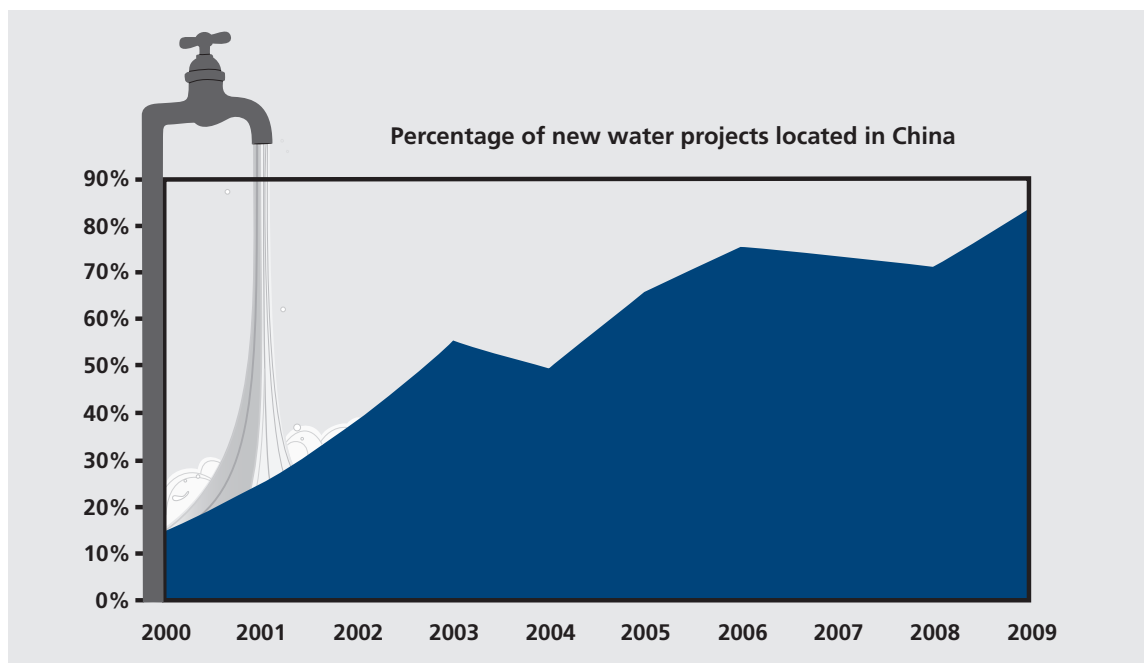
and Mexico, which implemented 45, 29, 12, and nine projects respectively. In this region, most projects were water supply concessions (79), followed by water and wastewater treatment plants BOTs (17).

Europe and Central Asia were also active in implementing new water PPP projects during the last decade: 14 countries signed 44 projects involving \$3.1 billion in investment. Eighteen of them were located in the Russian Federation. Most of these projects were for water utilities (40) and were implemented through management and lease contracts (27), concession (nine) and divestiture (four).

PPP activity was relatively less important in the three remaining regions: Middle East and North Africa, Sub-Saharan Africa and South Asia. In

the Middle East and North Africa, 16 projects involving \$3.3 billion in investment reached financial closure; most of them were located in Algeria (13) and were BOTs for desalination treatment plants (nine). Sub-Saharan Africa had 15 projects involving investments of \$180 million in 13 countries; the majority were water utility management contracts (nine). South Asia had 12 projects involving investments of \$378 million; all of them were located in India. Eight were for water utilities and four for treatment plants.

In addition to the shift in terms of geographical destination of water PPP projects toward China, the geographical origin of private water operators has evolved during the last decade. Some multinationals from high-income countries have



The opening of China to private participation in water infrastructure and its emergence as the first water PPP market among low- and middle-income countries was one of the most important changes of the decade.

progressively withdrawn from water PPP projects in low- and middle- income countries to re-focus on high-income countries and on less risky engineering, procurement, and construction contracts.

This resulted in notable changes. During the last decade, more than 55 percent of water PPPs were signed by private firms originating from low- and middle-income countries. This trend accelerated during the second half of the last decade, with more than 60 percent of new PPPs implemented by private operators solely from low-and middle-income countries. A high proportion of South-South water PPP projects (59 percent by number) were for treatment plants in China (174 projects). However, China was not the only destination for private operators from low- and middle-income countries. An important share of these South-South projects (23 percent by number) were for water utilities in Latin America (68 projects). Most of the South-South water PPP projects involved intra-regional or domestic private operators; inter-regional South-South water PPP projects remain rare.

These figures almost certainly understate the real scale of private sector service provision in general and the scale of South-South water PPPs in particular, since they consider only larger-scale

private operations. Private operators also include small and medium-size distribution companies as well as informal operators that cover low-income urban areas. The size of operation and the fact that some operators belong to the informal economy make it difficult to document the situation. However, a World Bank report found 10,000 small-scale service providers in a limited sample of 49 countries and an International Institute for Environment and Development study estimated that the global number may exceed one million.

Looking ahead, China is expected to remain proportionally an important destination for water PPP projects. Nevertheless, several external factors, like the long-term impact of the global financial crisis, or a policy change towards PPPs, remain difficult to evaluate. The market share of new entrants will depend partially on the strategy adopted by multinationals from high-income countries. In the meantime, small-scale private operators will continue to play a critical role in water delivery for poor people. 💧

All calculations are based on data from the PPI Database (World Bank and PPIAF): ppi.worldbank.org.

VIDEO | WATER: PRICE IT RIGHT, USE IT WELL

The *OECD Environmental Outlook to 2030* has identified water as one of the four critical environmental priorities for the coming two decades. Based on current trends, 47 percent of the world's population will live in areas of high water stress in 2030, and the United Nation's Millennium Development Goals on water and sanitation will not be met.



common MISCONCEPTIONS about water

1 WATER IS A PUBLIC GOOD...

In its natural state, water rains from the sky (at least in wet countries), flows from place to place supplying lakes and rivers, and gathers underground below private and public land. Water resources are indeed a public good. However, governments need to protect public water resources from over-exploitation (such as users living upstream leaving no water for those living downstream) and waste (users making an inefficient use of the scarce resource). They do this by tightly controlling the right to use water resources for commercial, public, and private purposes, through the issuance of a limited number of water abstraction rights. Any entity that is granted a “water abstraction right” has private property over the volume of water that it is allowed to collect from the public water resource. The water rights of users of water that do not provide a public service (such as bottling companies, farmers, or industries) are subordinated to those of the entities that provide a public service (such as the municipal water supply).

2

...THEREFORE IT SHOULD BE FREE

Drinking water is scarce and essential to life. Therefore the argument is often heard that it should be available at no cost. Food is also equally scarce and essential to life, but one rarely hears the argument that it should be free. In fact, if farms were owned by the state, one could expect inefficient production, waste, and food shortages (or high prices). Whenever a public good is scarce, making it free takes away any incentive to eliminate waste and to increase supply. Prices signal the utility, value, and scarcity of all goods, and make possible their efficient allocation.

To eliminate waste of water resources, the price of water rights should be established through the interaction of supply and demand. To ensure that municipal water supply systems are financially and technically sustainable, the average price for drinking water supplies should cover the full cost of clean water abstraction, treatment, and transport. Governments can easily set up cross-subsidy systems to ensure that even the lowest income groups can afford an acceptable level of consumption.

3

PUBLIC... NO, PRIVATE... NO, A PPP!

Municipal water systems are natural monopolies because constructing multiple networks of underground pipes to compete with each other is not economically feasible. Unfortunately, monopolies are rarely efficient, effective, or responsive to customers. In the absence of competition, monopolies charge higher prices in pursuit of greater profits and are unresponsive to end-users.

The only alternative to competition is regulation: to enforce through contracts the users' rights to water services of a certain quality level, at a competitive price. The ideal structure should not present conflicts of interest: the water service provision function should be unconnected to the (public) regulatory function, and from the (public) function of setting the levels of service. In practice, however, this often makes the communication among the private service provider, its public regulator, and government very difficult. The relationship is conflicted, making for an ineffective system.

Public-private partnerships in the water sector avoid the disadvantages of monopolies, and the conflicts inherent to regulation. By virtue of their economic and operational bond, the public and private sector reach a common understanding of the technical, economic, and social challenges involved in providing sustainable water services.

4

PPPs INVARIABLY RESULT IN HIGHER TARIFFS

Public water service providers are vulnerable to political considerations, which in almost all cases favor the minimization of water tariffs to the large mass of the existing users. If public funding is not available for new investments (for example, to expand service to the poor, who are not connected to the network) or to maintain the service, the infrastructure and service quality deteriorates. Public-private partnerships are often introduced as a last-minute measure to remedy unsustainable economic and technical situations. For example, private investors are requested to inject fresh capital for new investments under tightly controlled contractual or regulatory tariff frameworks.

The evolution of tariffs resulting from the introduction of the PPP depends in large part on the technical and economic situation at the point when the PPP takes over the water service infrastructure, and on the level of public financial support. The efficiencies produced by the private investors can bridge the gap to cover operating costs and help finance new investments, resulting in stable and sometimes decreasing tariffs. There is a growing body of evidence suggesting that private participation in the water sector does improve efficiency and increase coverage. While price increases are often held up as an argument against PPPs in the water sector, this is not necessarily borne out by evidence. Research by the Public Private Infrastructure Advisory Facility (PPIAF) found that in a sample of 1,200 water and energy utilities in 71 developing and transition countries, there was no systematic change in residential prices as a result of PPPs.

5

A WATER SECTOR PPP IS THE PRIVATIZATION OF WATER

A PPP is not a privatization. Privatizations typically involve the sale of publicly-owned assets or goods to private investors. This has occurred in the water sector only in a few cases, notably (and with a degree of success) in the U.K. and in Chile. In the water sector, however, when a PPP is implemented, the water resources invariably remain a public good that is never alienated. Public authorities seek to conserve and protect through regulation contract supervision.



UGANDA

Small-scale
water infrastructure
program

In small towns and rural areas of Uganda, where 90 percent of the population lives, water shortages are part of daily life. In these areas, 60 percent of the population lacks access to safe water, and waterborne diseases and infant mortality are widespread. Improved access and use of safe water and sanitation facilities are among the country's key priorities. To achieve this goal, the government decided to decentralize rural water supply delivery.

To help Uganda achieve greater efficiency and improve access to water through public-private partnerships, IFC signed a mandate to implement the Uganda Small-Scale Infrastructure Provider (SSIP) Water Program in 2007. A set of pilot transactions was implemented to modify the flawed contractual arrangements in use, improve the capacity of the key stakeholders, and model strategies to access financing.

SEEKING SUPPORT

Uganda's government had implemented PPPs in peri-urban and rural areas since 2001 and established management contracts with private operators in more than 70 small towns. However, these contractual arrangements were generally weak and plagued with capacity challenges, both at the national and regional level. Three program components were in need of support:

transaction advice, public sector capacity, and access to finance. IFC also addressed financing constraints and developed a training program based on the proposed generic management contract to address weaknesses in the area of contract administration among public sector stockholders. Elements of sustainability were built in throughout key activities of the program to ensure continuity.

DUE DILIGENCE

First it was important to conduct due diligence in ten small towns, uncovering contracts of short duration and varying performance indicators. At that point, a generic contract was proposed with a minimum term of five years, appealing to both private operators and lenders.

The geography of the areas in need was a significant area of research. Clustering towns

within close proximity to one another allowed for larger contracts that capture economies of scale, specifically on human resources and capital investments. However, since funding was secured for only one of the ten towns, this approach was abandoned. A bidding process was ultimately implemented solely for the town of Busembatia.

In the past, private operators in Uganda raised financing by using overdraft facilities provided by the banks or secured loans using other existing business, so improving access to financing was a priority. IFC identified alternative models with greater potential for success, including leveraging its relationship with local banks, which presented financial institutions for the first time with a viable business model for small town water operators.

Clustering towns within close proximity to one another allowed for larger contracts that capture economies of scale, specifically on human resources and capital investments.

THE ROAD AHEAD

Ultimately, Busembatia's five-year management contract was awarded to Trandint Limited, which satisfied the technical requirement, secured a financing arrangement with lenders, and offered the lowest total bid price of \$270,000—

below the available subsidy of \$300,000 allocated by The Global Partnership on Output-Based Aid (GPOBA). The new operator agreed to install 400 new connections during the first two years and avoid increasing tariffs for the duration of the five-year management contract.

Throughout the process, the advisory work was supported by the Austrian Development Agency. GPOBA provided funding for capital investment costs to support the private operator. Among the expected results of this arrangement: Residents of Busembatia will enjoy expanded access to water at the same tariffs until 2015, and 400 new water connections will be installed. Other results include:

- ◆ DFCU Bank, a Ugandan commercial bank, loaned approximately \$100,000 to the winning bidder for the Busembatia contract.
- ◆ Seventy representatives from local authorities participated in two IFC-designed training programs for public sector stakeholders.
- ◆ USAID is using IFC's relationship with local banks as a model for developing a risk-sharing product for banks to lend to private operators. ◆

OUTPUT-BASED AID

The Global Partnership on Output-Based Aid (GPOBA) is a partnership of donors and international organizations working together to support output-based aid (OBA) approaches.

OBA is an innovative approach to increasing access to basic services—such as infrastructure, healthcare, and education—for the poor in developing countries. It is used in cases where poor people are being excluded from basic services because they cannot afford to pay the full cost of user fees, such as connection fees. This supports PPP projects because OBA helps ensure the viability of a PPP by absorbing the cost of access to a particular public service for the target population.

GPOBA's new *OBA Data* is the first online database of OBA projects around the world. This puts access to comprehensive and in-depth data on the universe of OBA projects at the fingertips of development practitioners. The interactive tool offers advanced search features for easy access to OBA project profiles worldwide; interactive maps for easy identification of OBA projects; and custom reports, charts, and tables on project design features and performance. Download the eBook, *OBA Data: A Brief Introduction* (gpoba.org) to learn more. ♣



Photo © GPOBA

VIDEO: MAJI NI MAISHA

Innovative finance
for community water
schemes in Kenya.



An innovative GPOBA project is increasing access to clean and reliable water for rural communities in Kenya, using a blend of commercial finance and an output-based subsidy. The project is helping small community-based water providers access the finance they need to improve existing water systems and connect poor households to a piped water supply.

This project shows that investing in community water projects can be viable for commercial banks. Following a successful initial pilot, the program is being expanded nationally and will target over 165,000 beneficiaries in 55 communities. ♦

Private small water supply systems

By Ella Lazarte

Emerging lessons on sustainability show that delegated management of small piped water supply systems—mostly in the form of PPPs—is steadily taking root. There are encouraging results, such as increases in coverage and revenues in Mozambique and Uganda, which have led to the model’s rapid growth. Twenty-five percent of small piped schemes in 10 of the 17 participating countries in the [Water and Sanitation Program’s \(WSP\)](#) recent workshops held in Maputo, Mozambique, are already under delegated management. In some countries, such as Niger and Benin, numbers reach 50 percent. WSP’s top five lessons learned included:

- ◆ **A professional water service makes a happy customer.** Experience of private-sector providers demonstrated the benefits of a more professional management to improve water service quality, such as an increase of over 300 percent in-house connections in the small piped systems under PPP management in Mozambique.
- ◆ **A sustainable PPP is more than a signed contract.** We need to strike a finer balance between specificity and simplicity in contracts and adequate diagnostics of technical functionality and assessment of business profitability. Furthermore, there is a need for business plans to help further establish financial viability of water systems.
- ◆ **No financing, no PPP.** Rehabilitation and extension investment needs remain unfunded in many cases. Blending public and private sources of financing (such as grants and commercial loans) to water operators presents an opportunity to tackle this issue. A good example is the Kenya microfinance/OBA project.
- ◆ **Lack of regulation puts PPPs at risk.** Regulation remains the weakest link in the delegated management environment. Challenges are also significant in the areas of funding and data collection.
- ◆ **Business development services contribute to sustainable service delivery,** with providers offering benefits to both contracting authorities and operators. The experience in Mali of STEFI operators providing technical and financial audit services on a cost recovery basis illustrates this promise. ◆

WaterHealth International

WaterHealth International (WHI), based in India, offers customers safe, affordable drinking water by developing and marketing community-owned, decentralized water purification and disinfection systems and services to underserved villages. It has helped reduce the spread of waterborne diseases and has sparked a new sector for delivering clean water in India.

WHI's technology for purifying bacterial contamination in collected surface water was developed after a waterborne cholera epidemic in 1993 killed 10,000 people—in just one month. Each WHI system has the capacity to serve 2,500 to 5,000 people a day. Water is sold for less than \$.01 per liter.

An initial investment from the Acumen Fund in 2004 helped the company launch its first community water system in India. Because of WHI's significant impact on rural health, IFC has made three separate investments in WHI since 2009, totaling over \$20 million. Now, WHI has more than 300 water systems. About 250,000 people purchase safe water regularly. ♦

Source: IFC and Acumen project materials

The death of PFI credits

By Jeff Delmon

I know, I know: this inaugural column should follow the theme of the edition—water. I should write about water finance. Maybe looking at results-based internal transfers. Or how to use government budget, donor grants, and IFI funding to encourage development goals which fit so well with PPPs, like the recent work in [Indonesia](#) and Honduras, and using those future transfers to secure debt. Then again, I could talk about using secure revenue streams from water to access cheaper and longer debt, like the water revenue securitizations (if I can still use this word in polite company) that used to be so popular in the U.K. These of course foreshadowed the new French practice of securing bond issuances with Dailly assignments of government payment obligations. But let's come back to these topics in future editions. Today, I want to talk about the death of PFI credits.

As we know, PPPs can be a very attractive option for those concerned with the efficient management of the government balance sheet, for long-term supply of national infrastructure. But line ministries and local governments may be less convinced by PPPs. After all, PPPs cut into budget allocations, and the efficiencies available through PPPs often do not translate into larger budget allocations for the line ministry or local

government. So ministries of finance institute PFI (private finance initiative) credits or similar mechanisms. Exhibit A: India's viability gap fund (VGF), which (maybe due to its evocative name) has successfully inspired VGFs in a number of other countries.

These extra-budgetary sweeteners encourage line ministries and local governments to adopt the procurement method with the most benefits for the nation, where the government's planning and budget process does not create enough of an incentive. The U.K., however, has put the PFI credit out to pasture. Maybe local governments and their ministries have been evangelized, no longer needing encouragement to use PPPs when merited. Maybe the new Infrastructure U.K. is meant to create political incentives to make procurement decisions based on value for money. I hope they are right. But it would be a shame if the U.K. lost some of its infrastructure dynamism for the small price of PFI credits. Babies and bathwater – do we have to throw out one with the other? See, we're back to talking about water again. And in both cases, sometimes we need to be reminded of what we already know. 💧



Photo © World Bank

THINKING OUTSIDE *the* BUCKET

Partnerships for progress

Anders Berntell is Executive Director of the 2030 Water Resources Group (WRG), a consortium of public and private sector and civil society entities that helps countries address the challenge of water security. The WRG, which is housed at IFC, partners with country governments to pilot its unique public-private-civil-society model for water sector transformation. It mobilizes public and private sector actors, civil society, and academic and finance institutions to help change the political economy for water reform in countries by analyzing key issues and convening groups to engage in substantive dialogue and design joint solutions. Prior to joining the WRG, Mr. Berntell was Executive Director of the Stockholm International Water Institute.

Interview by Alison Buckholtz

You have had an extensive career in the water sector; how have you seen the challenges of water resource management change over the last 30 years?

We now have increasing population-driven resource constraints that come from higher demand. But we also have changing consumption patterns: richer people eat more meat, and that requires more water. On the plus side, the awareness of the challenges when it comes to water has changed quite dramatically over the years. I'm convinced that—on the level of public attention and alarm—the water resource issue is the next climate change. Significantly, the corporate sector has also become much more aware. We see this from companies' increasing participation and willingness to discuss what can be done.

register the same result. The corporate world has greater impetus to act because it will be affected more quickly. It's about corporate survival.

How have companies engaged with government on the water scarcity issue?

One of the best examples we have now is in South Africa. South Africa is not new to the discussion about water resource management, they've been at it a long time, but even there we see a reinvigoration of the discussion around water issues. We have been able to set up a strategic water partnership, a multi-stakeholder platform, to discuss actions with the government. The companies have divided themselves into three groups: those working with agricultural issues; those working on the challenges in cities; and those working on emissions, specifically from

Strong companies alongside strong governance can make things happen.

Why do you think business is becoming so active around this issue?

The bottom line. In a government, the time between when a resource constraint appears and when it shows up on the bottom line is so much longer than the time it takes for a corporation to

industrial activity including mining. So now in the mining group, for example, they are discussing ways to work with the municipalities to reduce their water consumption and reduce leakage. Both sides can win.

How does the WRG reach beyond the traditional players in the water sector?

First, WRG made the link between water and the economy very clear, showing facts and figures pointing to how much money would be spent for how much water over what period of time. The link between water and the economy was essential. We in the water sector need to get out of our own bucket, we are very good at discussing water resources with fellow practitioners but the real drivers of change are outside the sector, with national leaders and in the Ministries of Finance. We need to engage with these actors if we are to see fundamental change in water resource management. This is what the Water Resources Group is doing today in the countries where we work.

How do you reconcile affordability of water for the poor with pricing water at its true value?

Looking at it as an economist would, it makes sense that things need to be priced according to their value. Pricing water is an emotional issue for many but today we know how to price the use of household water, while providing subsidies for those who need that. For me, the price of water for household use is not the core of the problem. From a water resource perspective, only 10% of water resources go towards household consumption. Slumdwellers in many cities of the world unfortunately pay more for water than

businesses in the same city. So for me the issue is to focus on agricultural and other industry uses, and perhaps look at subsidizing usage. After all, it's a social good to keep small farmers in business in some countries.

Water governance by partnership, rather than regulation, is a novel approach. What makes this successful?

What makes these partnerships successful is when we have a good national champion on the corporate side, but also a very strong commitment from the government—because they felt they needed it, and took the lead in creating it. Strong companies alongside strong governance can make things happen. The WRG's partnership model creates that possibility. ♦



myth *vs* fact

Private sector participation in urban water and sewerage

By Edouard Perard

There is a perception among some scholars that the number of urban water and sewerage utilities operated by the private sector in low- and middle-income countries is declining, and that the urban water sector may be experiencing a “remunicipalization” phase. True or not, this belief merits close examination.

With the boom of desalination markets and increasing need for water treatment, it is true that most new private activity in the water sector concerns treatment activities rather than urban utilities. For example, 78 percent of new water projects with private participation signed during the last five years were for water treatment.

However, new urban water and sewerage utility projects with private participation reach financial closure every year in all regions. Over the last five years, 64 urban water and sewerage utility projects reached financial closure in 19 low- and

middle-income countries: 22 in East Asia and the Pacific, eight in Europe and Central Asia, 21 in Latin America and the Caribbean, three in the Middle East and North Africa, six in South Asia and four in Sub-Saharan Africa.

In fact, in 2010 the total number of urban water and sewerage utilities operated by the private sector reached a record high of 257 utilities in 35 countries. A closer look reveals that the total number of urban water and sewerage utilities operated by the private sector in low- and middle-income countries has actually never decreased over the last 20 years. The number of new and renewed projects implemented across the years outweighs by far the number of projects concluded or cancelled.

This trend is also verified at the regional level. Here, the number of urban water and sewerage utilities operated by the private sector has never significantly decreased over the last 20 years.

The Latin America and Caribbean region has the highest number of urban water and sewerage utilities currently operated by the private sector (149 utilities in operation), followed by East Asia and the Pacific (56), Europe and Central Asia (30), Sub-Saharan Africa (10), South Asia (eight) and the Middle East and North Africa (four).

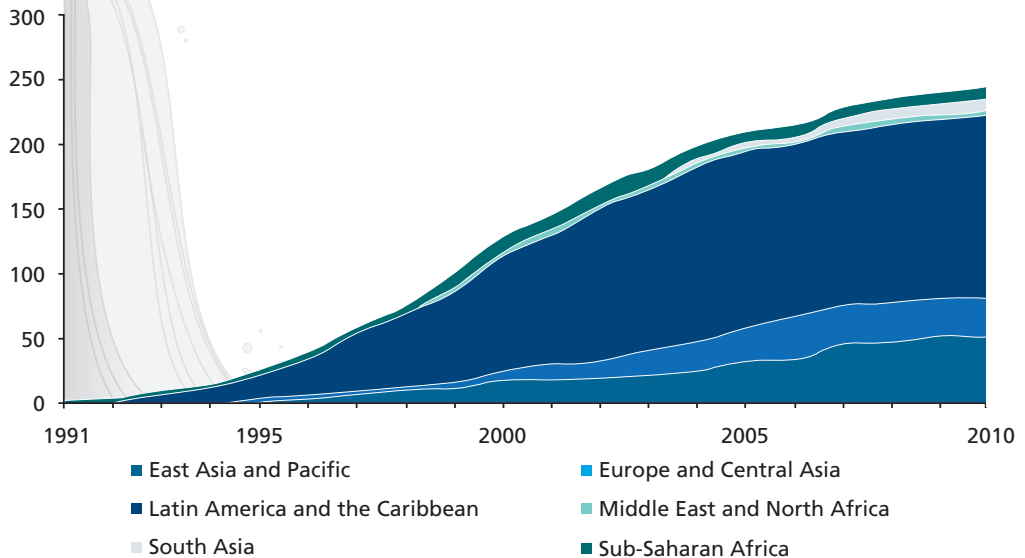
When it comes to the type of contractual arrangements, most urban water and sewerage utilities currently operated by the private sector are established under a concession agreement (165). Next is a management and lease contract

(61), followed by divestiture (20), and greenfield project (11).

A closer look at the data makes it clear that the hypothesis of an ongoing “remunicipalization” phase is more a misperception than a reality. If the current trend follows the evolution of the last 20 years, the number of urban water and sewerage utilities operated by the private sector in low- and middle-income countries should exceed 300 within the next five years. ●

All calculations are based on data from the PPI Database (World Bank and PPIAF): <http://ppi.worldbank.org>

Number of urban water and sewerage utilities operated by the private sector in low- and middle-income countries



By Cathy Russell

Informal settlements in Morocco gain access to water & sanitation

“ Everything became
POSSIBLE ”

In Morocco, many people who move to cities in search of a better life end up living in informal settlements without access to basic services such as clean water and sanitation. This has a negative effect on their health and well-being, especially for women and children who must spend several hours a day fetching water from public fountains or wells.

In 2005, Morocco made it a priority to extend service to these poor peri-urban neighborhoods and encouraged operators and local governments to reduce connection fees for water and sanitation services. The government and the operators of water utilities in three cities subsequently requested a grant from The [Global Partner-](#)

[ship on Output-Based Aid \(GPOBA\)](#), a World Bank-administered program, for a pilot project to expand services using an innovative output-based aid (OBA) approach. The pilot is being implemented by two private operators, LYDEC in Casablanca and Amendis in Tangiers, and a public utility, RADEM, in Meknès.

“Under the OBA approach, the operators receive the subsidy payment only after an independent agent has verified that they have delivered working connections to the targeted households,” explains Adriana de Aguinaga, acting program manager of GPOBA. “This increases transparency and ensures that the funding benefits the people who need it most.”



Photo © GPOBA

VIDEO: IMPROVING LIVES IN MOROCCO

The OBA approach is re-focusing service provision on households. This has increased accountability, strengthened partnerships between local authorities and operators, and made monitoring of service delivery a priority.



“The OBA subsidy fills the gap between the affordable level that these households can pay and the real cost of extending services to these households,” says Xavier Chauvot de Beauchêne, World Bank task team leader for the project.

So far, more than 50,000 residents of informal settlements have benefited from water and sanitation connections provided via the OBA pilot. The impact on their lives has been dramatic.

“Before, without water, it was difficult to plan or do things. I felt doors were closed but they are now finally open. Everything became possible,” said Hassana Jaatouti, a project beneficiary in Meknès.

The World Bank is now working with the government of Morocco to plan a scale-up program to bring water and sanitation services to other disadvantaged communities in urban areas, using the OBA method. 💧

BUCHAREST WATER & SANITATION

For decades, the municipality of Bucharest, Romania struggled with the city's water and sanitation needs. Because of leaks and waste in the distribution network, water losses were nearly 50 percent. That, along with an inadequate metering system, resulted in low revenues for the municipality, with water consumption levels four times the European Union average. To meet European Union standards, Bucharest was required to make large investments in sewerage and water storage, and to increase accountability and incentives to improve efficiency. But low tariffs meant that investment funds were insufficient.

The municipality hired IFC to facilitate efficiency gains so that consumer service levels could improve with minimum tariff increases, to transfer most of the investment responsibilities to the private sector and make it as self-sufficient as possible, and to avoid the dangers of a private monopoly. In 2000, Bucharest created APA Nova, a joint venture concessionaire company, to establish and manage all water and sanitation services in metropolitan Bucharest under a 25-year concession contract. This marked Romania's first public-private partnership in the water and sanitation sector, and it was one of the first sector

Photo © Danilo Pinzon/World Bank



Among major Asian cities, metropolitan Manila was infamous for its outdated, inefficient water system. The government agency responsible for delivering water and sewerage services was heavily indebted, and by 1995, three-quarters of the homes in the eastern half of Manila lacked 24-hour water services. Only 8 percent had sewerage connection. Overall, almost two-thirds of the water produced was lost to leaks, poor metering, and illegal connections.

That changed with the privatization of the Metropolitan Waterworks and Sewerage System (MWSS), which followed government legisla-

transactions in Europe. In the decade since this pioneering transaction paved the way for others, Bucharest has seen dramatic improvements to its water and sanitation needs, including:

- ◆ A new water treatment plant which reduced dependence on two older plants.
- ◆ Reduced water losses by 44 percent (during the 2002-2006 period).
- ◆ A new metering system and reduced leakages, leading to a 50 percent drop in total water demand.



tion in 1995 that fundamentally changed the sector. IFC ultimately helped the government design, manage, and implement a competitive and transparent bidding process for two parallel 25-year concessions that were awarded based on the lowest average water tariff bids. A \$7 billion investment to expand and improve metropolitan Manila's water and sewerage system focused on better service, lower rates, and fewer leaks and illegal connections. Successes included:

- ◆ An initial drop in rates of 74 percent in Manila's east zone and 43 percent in the west.

- ◆ In the east zone, households with 24-hour access to water increased from 26 percent in 1997 to 99 percent in 2006, and system losses were cut in half. Sewerage connections also doubled over the same period.
- ◆ Manila Water Company's "Water for the Poor" program now allows residents in the poorest neighborhoods to pay \$1.50 per month for clean water, a fraction of what they paid before.

MANILA WATER

Water concessions in **COLOMBIA**

By Luis A. Andrés, David Sisen & Philippe Marin

An increasing number of the urban poor in Colombia have access to water and sanitation because of an innovative approach by the government, which shares responsibility for key services with local authorities and the private sector.

These reforms were led by the cities of Cartagena and Barranquilla. Both cities contracted operations out to “mixed” companies jointly owned by the municipality, a private operator, and local private shareholders, with the city authorities retaining ownership of the infrastructure.

Results were impressive. Access to water and sanitation services improved substantially in both cities between 1994 and 2002. More than 80 percent of the new connections were in poor neighborhoods. Services became more efficient and reliable. Metering reduced losses from unaccounted-

for water and the time taken to respond to consumer complaints was dramatically reduced.

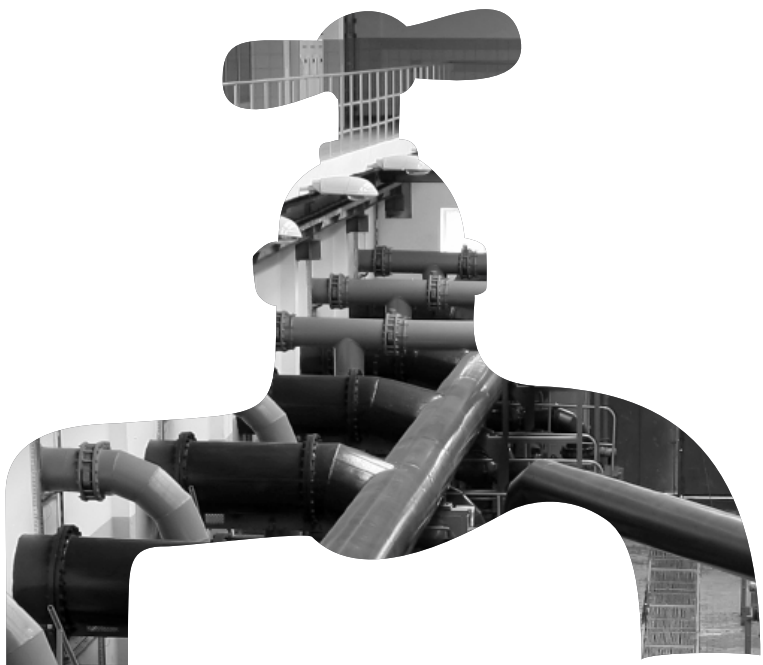
New approaches have now emerged. Municipalities are extending services to the urban poor by promoting local entrepreneurs in the water sector, creating a pool of small, local service providers who can respond more quickly to demand. The key to Colombia’s success in improving access to water and sanitation services has been devising homegrown solutions and adapting models developed in other countries to its own conditions and needs. 💧

Excerpted from [Charting a New Course: Structural Reforms in Colombia’s Water Supply and Sanitation Sector](#), World Bank (2010).

The case of **CARTAGENA**

About 30 percent of Colombians—many of them poor—live in small cities and towns with insufficient water supply and sanitation coverage. To remedy this, in June 1995 the District of Cartagena entered into a management contract with ACUACAR for the operation, maintenance, and rehabilitation of the water supply and sanitation systems for a period of 26 years, granting management autonomy to the operating partner. To fulfill its contractual obligations, ACUACAR is required to generate and maintain a minimum corporate capital of 4 billion Colombian pesos (approximately \$1.9 million in 2009).

In turn, ACUACAR executed a management contract with AGBAR. Its commitment as operating partner included the transfer of technology, recruitment of specialized staff, and training of workers, in addition to improving the indicators for efficiency in operations and investment for the rehabilitation and replacement of networks and systems. The operator's remuneration for its work is a percentage of ACUACAR's income from tariff revenue, in addition to earnings on its ACUACAR shares. 💧



THE INDUSTRY

behind the tap

***Nelson Beete** has been the chairman of **FIPAG (Fundo de Investimento e Património do Abastecimento de Água)** since its founding in 1998. FIPAG is the public asset holding company for water infrastructure for the major cities of Mozambique. In 1999 FIPAG entered into a PPP arrangement with **Aguas de Mozambique (AdeM)**, a consortium of water operators and Mozambican investors. This included a lease for the capital city, **Maputo**, and a management contract for the four cities of **Beira, Quelimane, Nampula, and Pemba**. Renegotiations followed the departure of international partner **SAUR**, and in 2010 FIPAG purchased the shares in AdeM of the remaining international partner **Água de Portugal (AdeP)**. IFC has been advising FIPAG on options for private sector participation across the urban water sector in Mozambique.*

Interview by Alison Buckholtz

How did you get your start working in the water sector?

I have an engineering background and am a civil engineer by training. Even before I went to university I was already working in the water sector. I grew up in the water sector, first as a draftsman in public works, and then as a medium-level technician, building a dam in paddy fields for rice. I went to work for a utility in 1983.

In 1995 I did a Master's degree in engineering and when I returned here, this project, called the National Water Development Project, was starting. I was appointed the project leader. This was the project that determined the reforms in water and created the government agencies. We had all that in place and had to sign the credit agreement with the World Bank to implement the reforms. Our organization only existed on paper at that time. There were no board members. I was the first employee and my first task was structuring the credit agreement with the World Bank. I've been here from the very beginning. Now at the head office, we have grown to 77 employees.

What's your experience been implementing a PPP? What's worked well?

In developing countries, there is a school of thought that involving the private sector in such a basic service like water is controversial. But water can be a business. Water can be managed professionally. There is an industry behind the tap that you have at home. What is important is the arrangement. It should be made in such a manner that the service will be efficient and that the water will reach as many people as possible. That should be the goal of any PPP.

Looking back to our first transaction, we expected that the private sector would come in and solve anything. Our expectation was that we do nothing and the private sector does everything. But then we had to renegotiate the contract and the second contract was quite restrictive. With the second contract, we tried to resolve the problems we had at hand at that moment. It is difficult in a 15-year contract to foresee what will happen in year 10. My view is that those

“ Water can be managed professionally... What is important is the arrangement. It should be made in such a manner that the service will be efficient and that the water will reach as many people as possible. ”

contracts need to be written in a manner that's flexible, that you can adjust as time goes by. When you have a system that is quite deteriorated, your first objective is to keep it running. That's where the focus is. But once it's running, what's next? Our contract was not written properly, to allow for change as time went by.

I also learned that a service contract is easier to maintain than a lease contract. Lease contracts, which we had in the beginning, are very difficult to manage because of division of responsibility with respect to maintenance and repair. It's very difficult to define where the maintenance starts and ends and where repair starts and ends. I believe that a service contract is much easier because there is no such grey area.

You terminated your lease early and bought the shares back. This termination process can be very acrimonious but in your case it's been good all around. How were you able to achieve that?

I must confess that it went very well. Subjective issues and emotions were put aside during the discussion and ultimate termination. We just looked at the facts. We were not discussing perceptions. Plus, AdeP wanted to sell, we wanted to buy. In fact, because of the positive tone of the discussions between ourselves and AdeP, now we are even friends, more friends than we were before, just because of how the whole thing

went. We are still corresponding because there are things to deal with, like providing additional documents, and it's just so smooth. It's unbelievable. I pick up the phone and they try to resolve the issue. It's amazing, when compared to any other negotiation. So this makes me very happy.

PPPs in water can be quite controversial, as you said, but in Mozambique it hasn't been as controversial. How have you managed the relationship with all your stakeholders?

First, there was political will for this to take place. So even when we were facing problems, the government was always behind it. That was very important. Second, we spent a lot of money leading public consultations, where we explained to different stakeholders what we were doing from the very beginning. We did this particularly with local authorities and the workers, and had lots of open discussions where people voiced concerns. For instance, the workers were afraid of losing their jobs. The local authorities were concerned about the tariffs and whether or not it would get out of control. Others would say, "Why bring in someone who wants to make a profit? It's such a basic service." So we listed all those concerns and answered them. We explained that the tariff would be set by an independent regulator, for example. We explained that sometimes the profit the private sector makes is lower than having a system badly man-

“ We had to manage expectations: Keep the politicians informed, keep the public informed. Even when there were problems, we had to say immediately how we are going to solve it. ”

aged. So we tried to address all the concerns.

We had to manage expectations: Keep the politicians informed, keep the public informed. Even when there were problems, we had to say immediately how we are going to solve it. Local authorities need to know that although we are bringing in the private sector, we will not get results overnight. Looking back, it was a good thing to spend resources and time managing expectations, trying to keep the key stakeholders informed about everything that was taking place.

You brought private-sector approaches into your own organization, and the quality is quite high. It's clearly a successful approach.

From an HR perspective, you have to define roles no matter what; people need to be held accountable and be rewarded when they perform. Our operation started because the government wanted to increase water coverage from 40 to 60 percent. We had a retreat with all the direc-

tors and they were showing an increase of one to two percent per annum, and we had to increase the coverage by 20 percent in five years. At one or two percent per annum, we would never get there. So we thought about how to go about this. One thing we found was that we had too many performance indicators, like 30. That's too many. The managers were confused. So then we tried to find the key indicators to track the business and got down to seven.

For those meeting their targets, we started to provide incentives. This is how our [private sector] approach got started. Before that time, we used to have lots of complaints about our commercial software; the problems were not fixed in time. Once we set the targets and provided the incentives, all of a sudden there were no more problems with the software. Because employees had a clear target and incentives, they managed to have a direct relationship with the supplier, they fixed the problem, and were no longer throwing problems back to us.

Most here have a fixed and a variable part of their salary. Now we don't have to argue with people about whether or not they have to work.

From time to time we just do performance assessments and if you did very well, you get 100 percent of your salary; if not, you get part of it. So our employees are very focused on meeting targets, and we provide assistance for them to do this. They never throw problems back to us. Those not performing, we simply replace them.

If you were the consultant on someone else's project, how would you advise them on a PPP transaction?

If I were a consultant going to a country, rather than introducing the PPP model up front, I'd try to work it backwards and ask what we need to do to deliver the service in the most efficient manner. We would definitely end up with some sort of PPP, either through technical assistance or a service contract. You have to concentrate on your core business. You have to find partners. You will end up with some sort of PPP, also combined with some public-public partnership, but keep the solution open from the start. I'd also stress

that PPPs are not a panacea for everything. Once we get the principles right, we could find the label. This is how I would conduct a discussion if I were a consultant.

What do you see next for Maputo?

We have to put the consumers first. We have to ask what is the arrangement that would enable us to get the service in an efficient manner and that meets our consumers' expectations. That's how we should look at it. That's how the private sector does business, especially in a competitive market. Water is a very localized business, so you have to have the right local experts, and make sure that business is carried out in a manner that fits well within our environment and our society. After 10 years, we now have the experience, know-how, and qualified staff. But you cannot do it without top international resources. It is impossible. How you combine all those things is the challenge.

With these elements in place we can meet our primary goals of managing expectations, keeping people informed, and delivering resources. ♦

“ You have to define roles no matter what; people need to be held accountable and be rewarded when they perform. ”

Legal & regulatory issues in PPPs

By Victoria Delmon

The PPPI Resource Center (worldbank.org/ppp) has been developed by the World Bank to provide guidance and materials on the legal, contractual, and regulatory issues around PPPs. It includes checklists and risk matrices as well as sample laws and regulations, terms of reference for consultants, and sample agreements and contracts.

Are you researching models of water PPP network contracts in Africa? We can help. The World Bank has developed and applied successfully in Francophone Africa over the past few years a hybrid concession-affermage contract for water networks. You can find an explanation of the hybrid structure in English and French, together with the text of the agreements, summaries, and annotations in French, on the PPPI Resource Center web site. If performance-based contracts are your primary focus, you can also find summaries and annotations of sample performance-based contracts and operation and maintenance contracts for water networks.

In several Latin American countries, as well as Spain, joint ventures have gained popularity in the water sector. The PPPI Resource Center has extensive archives on these ventures. You can ac-

cess explanatory notes as well as links to the legal frameworks behind them. Countries covered include Argentina, Brazil, Colombia, Costa Rica, El Salvador, and Spain.

Project-financed BOT initiatives, as well as design, build, and operate contracts, can open up additional sources of funding for new water and wastewater treatment plants. Sample agreements in this arena can be found as well.

The PPP in Infrastructure Resource Center for Contracts, Laws and Regulation (PPIRC)—formerly the Infrastructure and Law website—is designed for task team leaders and other operational staff of the World Bank group working on the planning, design, and structuring of infrastructure projects, especially those involving the private sector. Resources on the web site address contractual and legal issues associated with infrastructure reform and PPP projects, and provide practical guidance notes and checklists. ♦



Investing in **IRRIGATION**

Strengthening private sector participation

By Cledan Mandri-Perott & Jyoti Bisbey

Irrigation of agriculture is central to rural development and growth. To achieve the best results, governments must carefully consider how investments can improve the use of existing water resources. Public-private partnerships (PPPs) can improve delivery and management of irrigation services. The construction method, the way investment is recovered throughout the life of the project, and terms by which agricultural production is linked to the project are critical aspects of the design of sustainable irrigation PPPs.

Many aspects of the irrigation sector have changed throughout the decades, but not the basic development paradigm. Public funding for capital investment, combined with public management and a subsidized supply of water resources to farmers, has until recently moved the sector forward incrementally but dependably. Now, climate change, constraints on water resources, and the need for increased agricultural

yields to resolve food security have altered the rules of the game. Governments concede that public resources are limited, and they need to prioritize to achieve better value for money for the agricultural sector. One promising solution involves a combination of public and private expertise for improved sector management and delivery of irrigation services.

continued on page 46

IRRIGATION

PPPs in irrigation have a limited track record, but some form of concessional financing is typically implemented to allow for private sector involvement. In most cases, schemes would not be sustainable without some form of public support.

GUERDANE, MOROCCO (2004)

Project costs: \$85 million
Farming activity: Cash crops
Size & scope: Up to 10,000 ha
PPP model: Design Build Operate
Scope of private contract: Irrigation Only
Bidding variable: Lowest tariff
Bidding Status: Two bids.
Operating successfully.

WEST NILE DELTA, EGYPT (2011)

Project costs: \$450 million
Farming activity: Mixed
Size & scope: 80,000 ha
PPP model: Design Build Operate
Scope of private contract: Irrigation Only
Bidding variable: Lowest tariff
Bidding Status: One bid (not opened).
Project was restructured.

CHANYANYA, ZAMBIA (2008)

Project costs: \$2.5 million (pilot) + \$32 million
Farming activity: Subsistence
Size & scope: 300-2,600 ha
PPP model: Build Operate Transfer
Scope of private contract: Irrigation Only
Bidding variable: Lowest tariff
Bidding Status: InfraCo led development.
Operating successfully.

MEGACH-SERABA, ETHIOPIA (2011)

Project costs: \$47 million
Farming activity: Subsistence
Size & scope: 4,040 ha
PPP model: Operate & Maintain
Scope of private contract: Irrigation Only
Bidding variable: Quality-based & minimum OMM payment
Bidding Status: Five bids.
Under negotiation.

HOW TO IMPROVE IRRIGATION SCHEMES?

Resulting from decades of massive investments in water development schemes, irrigation today waters one-fifth of the world's cultivated land. Much of this investment has taken place in developing countries, and many of the world's poorest people depend on food produced on irrigated land.

Irrigation investment reached its peak during the mid-1980s, when \$2.5 to \$3 billion per year was committed by external funding agencies globally. However, since the 1980s, total investments have substantially decreased. The World Bank now invests less than \$1 billion per year in irrigation projects, and total spending by all donors and financial institutions averages around \$2 billion per year. This fall is partly a result of the general decline in agricultural finance since the mid-1980s.

Lower levels of investment in irrigation schemes

While some irrigation systems have operated successfully for long periods of time, high and increasing construction costs of the schemes, poor production performance of many irrigation systems, falling real prices of crops, and concerns about negative environmental impacts of projects have led to a slowdown in the rate of irrigation investment. This has also significantly reduced the willingness of donors and international financial institutions to invest in irrigation activities. And the tight financial position of many governments limits their ability to fund projects from domestic budgets.

Lack of financing for operations and maintenance

The dramatic expansion of irrigated areas in the world has not been matched by a similar expansion in financing the management of irrigation systems after construction. Consequently, in many systems water is wasted in the upper and unavailable in the lower sections, while water deliveries are often untimely and unreliable. Pumping stations, canals, gates, and metering systems are in disrepair, and only about 25 to 30 percent of water diverted into large canal systems in developing countries reaches thirsty crops.

Insufficient cost recovery

Low water charges and poor recovery rates risk the efficient maintenance of the existing water infrastructure as well as additional investments on future water-development projects. Charges rarely reflect the cost of production, consumption increases beyond the optimum level, and subsidies that may be in place disproportionately serve the better-off. This pattern of financing creates a vicious cycle: financial difficulties cause irrigation departments to defer maintenance to the detriment of the water system, while farmers complain about the poor services and have little incentives to pay for services. Despite all this, the politically-rooted system of public provision and subsidized water charges protects the water economy from the influence of actual market forces.

Emphasis on physical infrastructure

Government efforts to improve the management of irrigation have focused mostly on building hydraulic infrastructure and on the creation of physical capital in the form of dams, aque-

ducts, diversion weirs, and canals, and less on institutional and implementation arrangements. However, persistent problems with the design, construction, operation, management, and use of irrigation projects have led donors and national governments to reevaluate the emphasis on engineering and technical design in irrigation planning and management.

PRIVATE PARTICIPATION: A POSSIBLE SOLUTION?

In response to these challenges, governments have delegated management responsibility to other institutions, notably user associations or private companies. However, along with the pressures to decentralize and transfer the management of irrigation systems comes a need to understand the factors that contribute to the long-term success of irrigation schemes. Understanding how to design and manage this sub-sector is necessary for market forces to improve irrigation systems' performance and sustainability.

Including private participation in this sector is complex. The system needs to be designed sustainably from an engineering and environmental perspective, and also in terms of operations and maintenance (including any linkages between production and capital investment). Appropriate institutional arrangements and contractual frameworks need to be put in place to transition seamlessly from one implementation arrangement to the next. Most importantly, the right incentives need to be created for the private sector, farmers, public agencies, and others to achieve a sustainable, truly collaborative scheme.

GOVERNMENTS WILL CONTINUE TO PLAY A MAJOR ROLE

As this incipient market evolves, the need to create the necessary linkages between the private sector and the public becomes even greater. Regardless of the level of private sector involvement (for example, in construction, financing, and agricultural production), some form of active public sector collaboration is needed to make these projects successes. This underscores the fact that in irrigation PPPs there is a need to create a market that is prepared to invest in long-term assets, and that the necessary incentives are in place to ensure sustainability. Innovation is needed in structuring projects, whether it is in contract design, financing structures, or procurement.

A number of other factors will affect success, and they are all rooted in understanding that the currently constrained financial markets will affect the design and type of any developing PPP structure. Strategies and projects must be adapted to new market conditions. These include an early focus on bankability of the proposed scheme and a clear delineation of roles among the construction of assets, their maintenance and operation, and the production of agricultural goods. Flexibility in bidding to allow financial close is also key. Most important, rethinking the manner of government support—both financial and regulatory—will transform today's limited progress into the next generation's irrigation success story. ♦

Reinventing rural farming



The majority of India's rural farmers live from crop cycle to crop cycle. Drip irrigation technology from Jain Irrigation might change that.

New drip irrigation technology from Jain Irrigation Systems Ltd., has the potential to reinvent farming for those in rural regions who lack access to the most basic technology. The equipment uses a series of perforated tubes that deliver water directly to crops, reducing losses to evaporation and weeds. But the company recognized that when working with small farmers it would need to do more than just sell technology: Pitching the drip irrigation over the traditional flood irrigation required convincing farmers of the value of up-front investment.

The company's approach paid off. Jain's drip irrigation has allowed 25,000 small farmers in

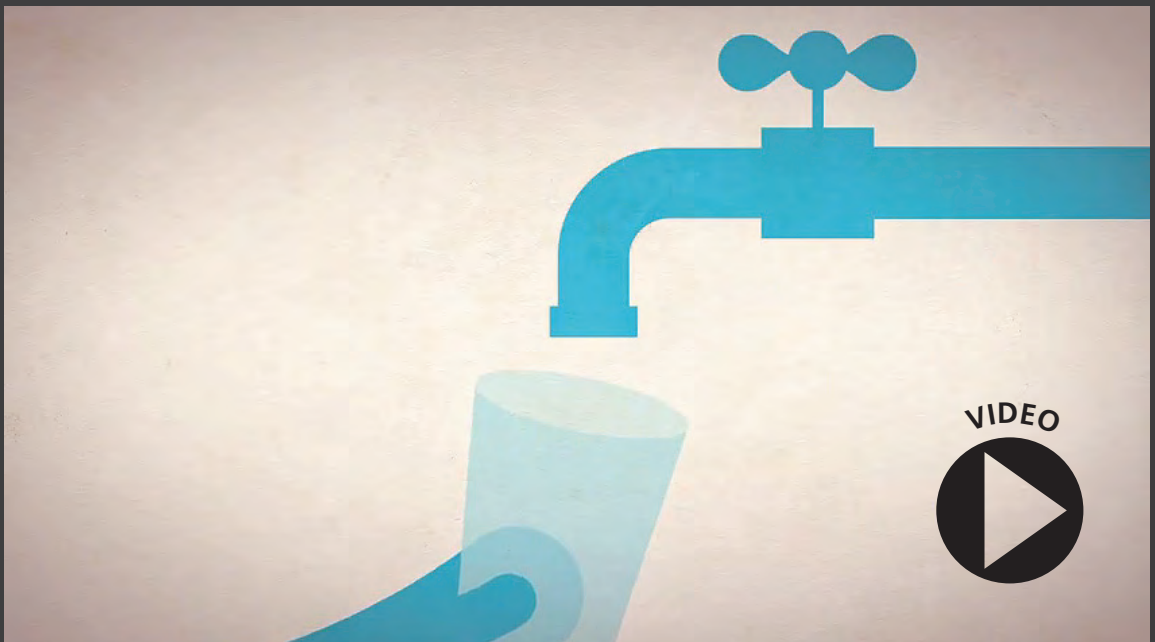
India to increase annual individual farm income by up to \$1,000 per year, and has led to savings in water usage equal to the annual water consumption of more than 10 million households. As the *New York Times* commented, "It almost sounds too good to be true: a technology that cheaply improves crop yields, reduces water use, and allows the monsoon to replenish groundwater aquifers. Let's hope it isn't."

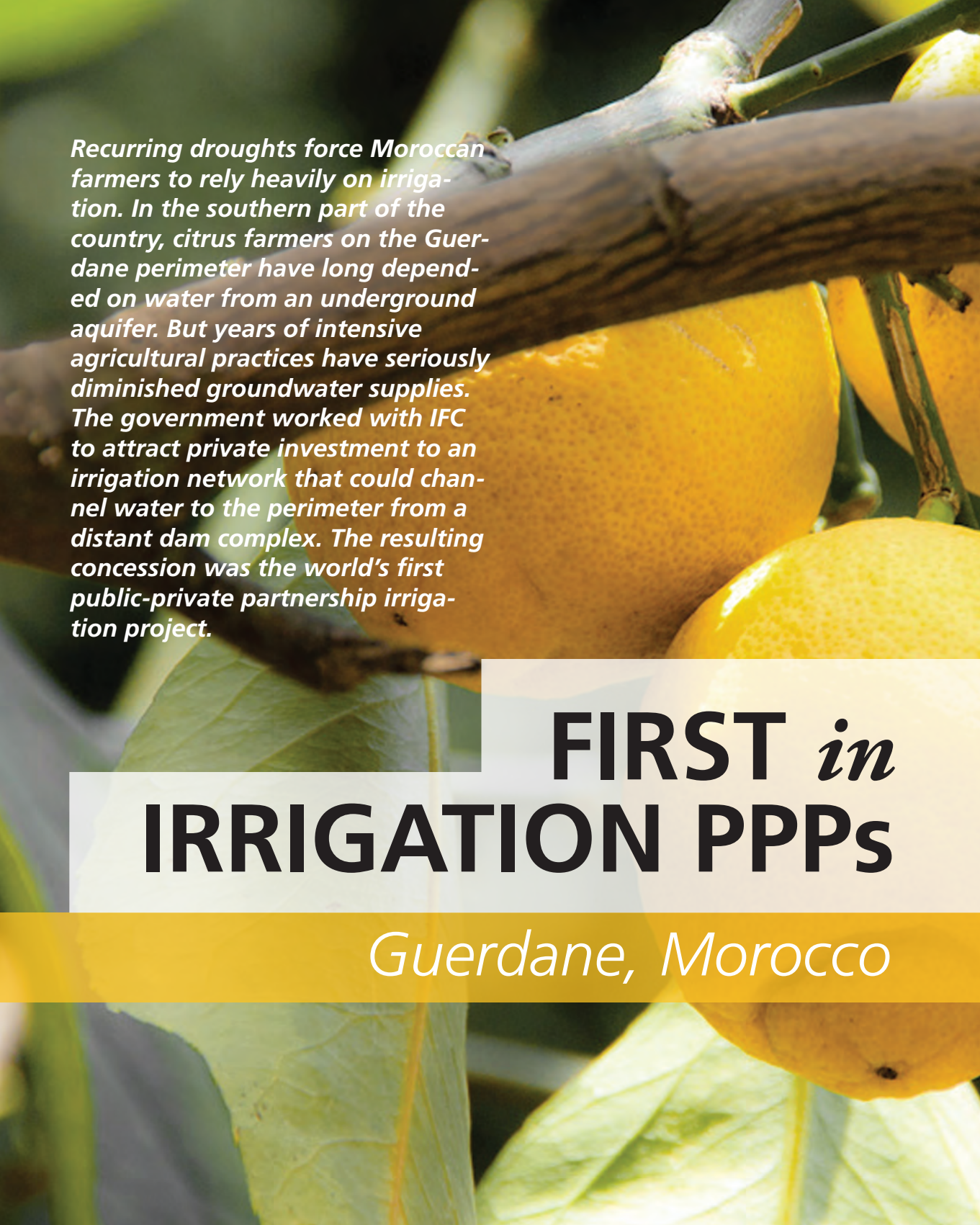
Jain Irrigation received the [2010 IFC Client Leadership Award](#) for its inclusive approach to sustainable agriculture. ♠

Source: IFC and Jain Irrigation

WATER *changes* **EVERYTHING**

Almost a billion people live without clean drinking water.
We call this the water crisis.





Recurring droughts force Moroccan farmers to rely heavily on irrigation. In the southern part of the country, citrus farmers on the Guerdane perimeter have long depended on water from an underground aquifer. But years of intensive agricultural practices have seriously diminished groundwater supplies. The government worked with IFC to attract private investment to an irrigation network that could channel water to the perimeter from a distant dam complex. The resulting concession was the world's first public-private partnership irrigation project.

FIRST *in* **IRRIGATION PPPs**

Guerdane, Morocco

IRRIGATION

The perimeter of Guerdane, in the Moroccan province of Taroudant, covers approximately 10,000 hectares and produces 50 percent of Morocco's citrus crops. For years, private wells pumping into the Souss underground aquifer were the only source of irrigation water for about 600 citrus farmers, but due to overexploitation, the level of groundwater was decreasing by an average 2.5 meters a year. Many farms were abandoned as private wells dried up or pumping costs became unaffordable. The threat to Morocco's high value citrus industry was undeniable.

To alleviate the lack of water in the perimeter, the 1995 Watershed Management Plan of Souss-Massa allocated an average yearly volume of 45 million cubic meters of water originating from the Mohamed Mokhtar Soussi-Aoulouz dams, about 40 miles away. The government sought a private partner to construct a 300 kilometer water irrigation network to transport the water and a distribution system to deliver it to farmers based on the size of their citrus groves. The surface water allocated for the project met half of the water needs of the citrus farms in the perimeter.

The Moroccan government entered a 30-year concession with Omnium Nord-Africain to build, co-finance, and manage an irrigation network to channel water from the dam complex and distribute it to farmers in Guerdane. The total project cost was estimated at \$85 million, with the government providing \$50 million, half as a grant and half as a subsidized loan. The private partner provided the balance.

The concessionaire has exclusivity to channel and distribute irrigation water in the perimeter. Operational, commercial, and financial risks

related to the project were allocated to the various stakeholders. The construction and collection risks were transferred to the concessionaire, and the government was responsible for ensuring water security. The demand/payment risk was mitigated by a subscription campaign; farmers paid an initial fee covering the average cost of on-farm connection. The concessionaire's construction obligation did not begin until subscriptions were received for 80 percent of the water available. The risk related to water shortage was allocated to the concessionaire, the farmers, and the government.

The unique selection criteria was the lowest water tariff, which supported the government's goal of making surface water accessible to the largest number of farmers possible. The public subsidy was designed to maintain water tariffs equivalent to current pumping costs. The winning bidder provided a tariff significantly lower than the price that farmers in Guerdane had typically paid for groundwater supplies.

RESULTS

- Safeguarded a citrus industry that provides direct and indirect jobs for an estimated 100,000 people.
- Made surface water available to farmers at an affordable price.
- Mitigated the risk of depleting underground water resources. 💧






Photo © Nico Saporiti

Where there's **MUCK** there's **MONEY**

Reinventing
the economics
of sanitation

*By Miriam Otoo, John E.H. Ryan
& Pay Drechsel*

Urbanization in low-income countries—which typically takes place against a backdrop of poverty and food insecurity—strains the allocation and use of land, water, and nutrients in peri-urban and urban areas. One of the resulting challenges is what to do with the daily generation of millions of cubic meters of solid and liquid waste. Sanitization of this waste is seen traditionally as a public sector obligation, and consumes a large part of municipal budgets. Until recently, private sector participation has been limited to the extraction, treatment, or conveyance of solid waste or fecal sludge from on-site sanitation systems to disposal sites.

Now, an emerging set of innovative entrepreneurs are recognizing the opportunities in waste. Private companies can profitably transform nutrients, water, energy, or organic fertilizers from the waste streams into vital agricultural resources. In Ghana, for example, Waste Enterprisers contracted with a municipality to transform the existing wastewater stabilization ponds into thriving aquaculture facilities. Fish, well fed on the nutrients from the waste, are then sold by the company for a profit. Part of the income is being spent on maintaining the wastewater treatment ponds, guaranteeing a share of the spoils for all partners.

Waste Enterprisers' business model works, according to Founder and CEO Ashley Murray, because it is built around harnessing economic value from human waste. "By rebranding human waste as a needed input instead of a waste output, our waste-based businesses create both a physical and financial demand for waste, completely reinventing the economics of sanitation," Murray said.

Wastewater from agro-industrial applications is also being reused to generate energy to meet the internal thermal and electric power requirements of the industries and to sell to the local electric company. For example, plants run by the Thai Biogas Energy Company convert wastewater from the processing of cassava and other agricultural commodities into biogas. This then fires the turbines that generate electricity for the internal requirements of the agro-industries and distribution in the local grid. Any excess can then be sold to the local grid. The purified waste water is used for irrigation or returned to the public canals.

Energy recovery is another evolving part of the reuse equation, as it can provide the economic leverage for the recovery of nutrient or water resources to address soil fertility depletion and water stress.

NEW ROLE FOR PPPs

Public-private partnerships (PPPs) have an important emerging role in transforming waste into a business opportunity because of the potential cost leverage for sanitation services. Until now, the magnitude of waste resource recovery has remained very limited and largely restricted to the informal sector, even though the agricultural value of these waste resources is well recognized.

The Resource Recovery & Reuse program led by the [International Water Management Institute \(IWMI-CGIAR\)](#) is hoping to change this situation. In partnership with the [International Fund for Agricultural Development](#), the [Swiss Agency for Development and Cooperation](#), and the [Bill & Melinda Gates Foundation](#), the new program is identifying innovative enterprises in

low-income countries that reuse domestic and agro-industrial waste resources, including fecal sludge. Data analysis will allow testing of a variety of scalable business models.

IWMI's initial research has found that entrepreneurial initiative and well-crafted PPPs are vital to the success of these new waste entrepreneurs. There are limits in public capital and a need to leverage private capital and entrepreneurial talent to bring about change. Therefore, emphasis must be placed on analyzing the role of entrepreneurship and PPPs in relation to the sustainability and up-scaling potential of existing and prospective waste reuse businesses.

Though potential opportunities for business in waste reuse are clear, it has also become apparent that public and private actors must work together to ensure scaling-up and sustainability of such businesses. For example, composting of solid organic waste into organic fertilizer is recognized as a reuse system with multiple benefits, especially in areas where resources for agricultural production are limited or fertilizer prices are increasing. However, most composting plants set up by researchers or nongovernmental organizations remain biased toward technical results and hardly survive their pilot phase.

Successful organic fertilizer producers, on the other hand, have leveraged key strategic partnerships with the public sector as well as community-based organizations and other private entities. These relationships reduce risk associated with high capital investments and optimize the allocation of resources and activities while increasing market access. This opens the door to profit—and the sustainable solutions that profits ensure. ♣

PPPs in irrigation eLearning

By Clive Harris

The irrigation sector plays a crucial role in food production, but there have been ongoing difficulties raising financing and sustaining the productivity of investments. In particular, maintenance has been a serious problem: cost recovery in the sector has been too low even to recover operation and maintenance fees. Traditional irrigation plans have been founded on massive public programs, many of which have been abandoned after a prolonged period of neglect.

There is a growing interest in using PPPs to provide more efficient and sustainable irrigation infrastructure and services. To assist practitioners in understanding some of the key issues on irrigation PPPs, WBI launched “*Public-Private Partnerships in Irrigation Management*,” an e-learning course, in July 2010. This short course is a part of the WBI core learning program, “*Climate Change Adaptation for Managing Agricultural Water*.” It aims to improve our understanding of how some fundamental water management challenges can be addressed through private sector participation, a relatively new concept in agricultural water management in most countries. The development goal is to foster sustainable agriculture water services to farmers, an even more crucial goal in light of changing climate conditions.

The three 30-minute e-modules help break through the jargon and myths around PPPs, especially irrigation water management. The goal is to understand the core features, the differences between various PPP models, and how a well-designed PPP can help overcome common problems with government-provided irrigation services. The e-learning draws on case studies and walks learners through the stages of developing a PPP transaction, from engaging with stakeholders to designing regulatory and monitoring arrangements. The e-learning course is available on WBI’s website (wbi.worldbank.org) under Learning ▶ Learning Products ▶ Climate Change Adaptation for Managing Agricultural Water.

WBI also held an e-conference on PPPs in irrigation on the Global PPP Network (pppnetwork.info). To view this, go to the Network, join if you are not a member, and view under Exchange ▶ E-conferences.

To learn more about WBI’s work on PPP capacity building go to wbi.worldbank.org and look for public-private partnerships under WBI Topics. ♠

PILOTING PROGRESS Irrigation in Zambia

In 2008, a successful pilot irrigation PPP brought together small farmers and commercial farmers in Chanyanya, Zambia. Building on that foundation, [InfraCo Africa](#) is scaling up to cover much of the Kafue district. The projects provide farmers with access to year-round irrigation with centralized management to create a sustainable commercial farming operation.

InfraCo Africa stimulates greater private investment in African infrastructure development by acting as a principal project developer, focusing on lower income countries, and funding early stage, high-risk initiatives. It takes an equity stake in the project and makes decisions that will lead to a socially responsible and successful construction and operation. InfraCo Africa is funded by [PIDG \(Private Infrastructure Development Group\)](#), a coalition of donors mobilizing private sector investment to assist developing countries in providing infrastructure that will boost economic development and combat poverty. ♠

Not all wastewater is the same. Yet in many cities, rain, greywater, and blackwater receive equal billing when it comes to treatment: all flow directly into municipal sewer systems. That's why a team of University of Maryland students, faculty, and professional mentors designed WaterShed, their first place-winning entry in the U.S. Department of Energy Solar Decathlon 2011.

Though the primary objective of the Solar Decathlon is to challenge teams to build and operate solar-powered homes, WaterShed's team saw the contest as an opportunity to take sustainable design a step further. With the nearby Chesapeake Bay (on the U.S.'s eastern seaboard) serv-

ing as inspiration, the team made water conservation and reuse a priority, creating a sustainable home that is functionally and aesthetically in harmony with its environment while protecting and producing resources.

One of the team's primary goals was to incorporate constructed wetlands into the design as a way to recycle rain and greywater. WaterShed's design, successfully used for years in commercial installations, offers a compact version fit for a residential scale. WaterShed's constructed wetlands allow the homeowner to harvest and reuse both rain and greywater for landscape irrigation and to support its on-site edible gardens.



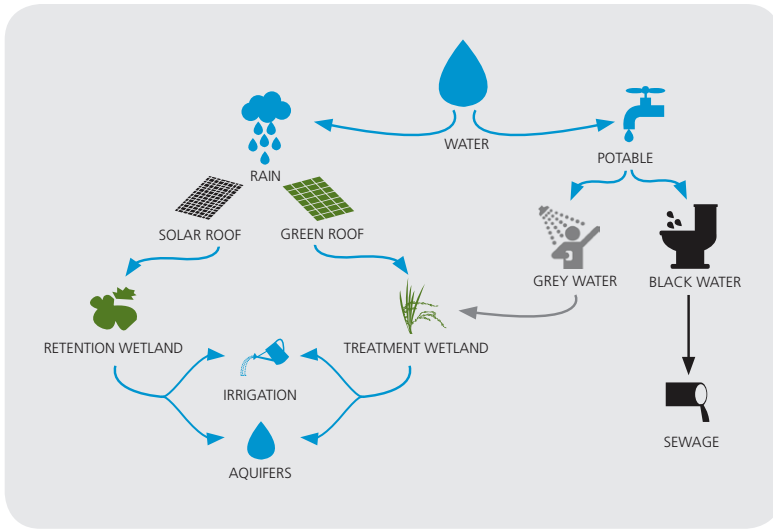
Photo © J. H. Mason

CONSTRUCTED WETLANDS

Recycled water feeds residential gardens

By Maggie Haslam

IRRIGATION



It blends in seamlessly with the home's architecture and landscape. There are other benefits, too. Recycling grey-water minimizes impact on sewer systems, saving money, energy, and above all, water. Irrigating with water processed by constructed wetlands can reduce water usage by 30 to 50 percent a year.

WaterShed's constructed wetlands resemble the natural marshes found in the Chesapeake Bay. They are effective water filtraters in all kinds of

weather, including temperatures below freezing. The water harvested on site comes from two primary sources: storm water, which funnels directly from the home's inward sloping roofs; and greywater from the bathroom shower and sink, which sit directly above the wetland beds. Water enters the wetlands, where native plants work with microorganisms to strip it of soap, pollutants, excess nutrients, and other pathogens. Once filtered, the water can be used for irrigation, stored for future use, or returned to the water table.

All of WaterShed's irrigation water is recycled greywater from the home's wetlands. Combined with compost made on site, it feeds over 15 types of fruit, vegetables, and herbs in the garden, as well as the surrounding landscape. This provides the homeowner low-cost and relatively low-maintenance access to fresh, organic food while controlling their impact on the environment. 💧

Water type

Use



Potable

Drinking

Rain

Irrigation

Grey water
(no biosolids)

Irrigation
(w/filtering)

Black water
(biosolids)

Any
(w/treatment)



Small farmers, **BIG DREAMS**

Growing entrepreneurs

Zambia's Irrigation Development and Support Project is an integral aspect of the country's initiative to build multi-level, self-contained farm blocks to create economies of scale and volume and more flexibly respond to consumer demands.

The Irrigation Development and Support Project enhances income generation within these farm blocks by irrigating small plots for household use. Successful smallholders

partner with each other to expand their reach, and these groups then team up with commercial farmers for greater access to resources, ultimately enhancing the country's food security.

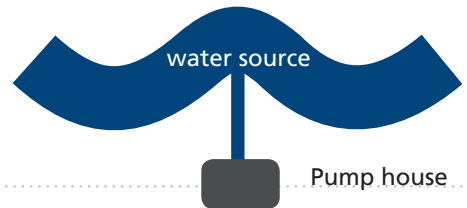
Contributed by Indira Janaki Ekanayake, Francois Onimus, and Barnabas Mulenga, with assistance from Cambridge Economic Policy Associates, Ltd.

Tier

Irrigation Model

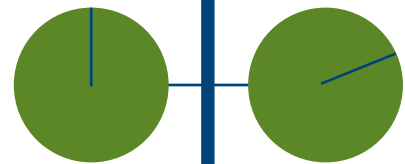
BULK WATER INFRASTRUCTURE:

Pump and mains pipes; may include dam/reservoir.



Professionally managed pivot irrigation growing marketed food and cash crops, purchasing produce from emergent farmers, and providing support services.

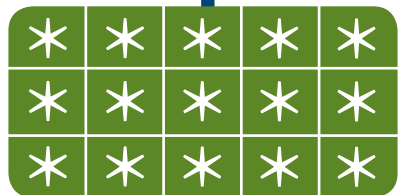
TIER **3**



Pivots (60-70 ha each)

Serviced blocks for emergent farmers growing food and horticultural crops under sprinkler or other irrigation for sale to and supervised by the professional farmer.

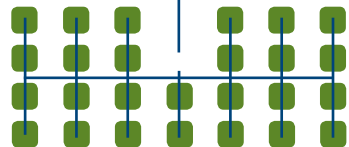
TIER **2**



Serviced blocks (c.5 ha per farmer)

Smallholder gardens or land currently farmed can grow vegetables for local and subsistence consumption under some basic form of irrigation (e.g., furrow).

TIER **1**



Smallholder gardens (<1 ha each)



Photo © Pipowitz

Thirsting for change


Italy's water sector

*By
Nico Saporiti*

The intake of the Villoresi irrigation canal is a monumental structure of classical beauty: it tames the blue waters of the River Ticino, just below the outlet of Lake Maggiore, and quenches the thirst of 85,000 hectares of otherwise dry land to the north of Milan.

This imposing project was designed, financed, and built entirely with private capital between 1877 and 1890. A 90-year concession was granted by the King of Italy only 15 days after receiving the investment proposal from the original investors. The original structure of the concession contract included the option for the water off-takers to buy out the concession. This option was called in 1918 when the farmers formed a consortium of water users and took over the concession and the infrastructure.

With such a head start in the development of water sector PPPs, one would imagine that in Italy such contracts would be widespread and well known. In fact, the opposite is true, and the political debate around the meaning of private sector participation in water services is as heated, alive, and confused as ever. A leading national newspaper printed, in the same edition, one article broadly supportive of a popular movement against private involvement in water service providers, and another article denouncing a case of pollution by a (public) water company that had been discharging untreated sewage and hazardous waste in the Bay of Naples.



Misunderstanding and strong opinions are not limited to Italy. Regardless of location, government officials wishing to implement a water PPP must begin with realistic expectations. Here are a few:

- ◆ Private investors have a strong profit incentive to introduce operational and investment efficiencies, but ...

Operational efficiencies cause a redistribution of economic benefits, from the sources of waste (overstaffed workforce, suppliers and contractors, water thieves, corrupt staff) to consumers (reduction in tariffs) and to investors (profits and dividends). The beneficiaries of the status quo, in the broader sense, will lose out from the transition to a PPP model. Operational efficiencies typically offset only a portion of the economic burden on the end consumers of the transition from heavily subsidized operations, to a full-cost recovery model.

- ◆ Private investors can mobilize a significant amount of private capital to fund new investments, but ...

They expect those investments to generate a positive economic return, and generally have much higher return expectations (i.e., capital costs) than the public sources of funding.

- ◆ Private investors are more efficient in selecting and implementing (on time, on budget) capital investments, but ...

They have limited ability to promote the awareness among public consumers of the often intangible or delayed (long-term) environmental benefits brought by expensive capital investments in waste water treatment, leakage reduction, or drainage management.

Private investors cannot miraculously break the economic balance in play among tariff revenue, operating costs, subsidies, and cash available for investments. It is unreasonable to expect private operators to transform, in a few years, a loss-making, subsidy-dependent water company incapable of maintaining its asset base. It is even more outrageous to expect them to transform into a profit-making company capable of financing new investments, without a tariff increase to reward the capital investment or a capital grant to subsidize tariff levels.

Perhaps most important is that private sector participation and investment in the water sector is not a substitute for sector reform and regulatory oversight, which is invariably a prerogative of the government. For the private investor to produce strong results, its public sector counterpart, the regulator, needs to be equally empowered. Local sensitivities and the specific technical and economic conditions of each operation require careful and continuous adaptation. This is the lesson from the 120-year-old Villoresi irrigation canal, which was successfully designed, financed, constructed, and operated for many years by private investors, and is now successfully owned and operated by a consortium of public entities. ◆

FAST FACTS

The amount of water on Earth:

326,000,000


TRILLION GALLONS with less than



being drinkable

The average American uses **176**
GALLONS of water per day

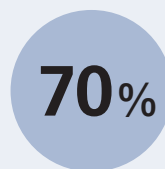
The average African uses **5**
GALLONS of water per day

Water scarcity affects  one in three people globally

46% of people on Earth
don't have water
piped to their homes

3,575,000

people die each year from
water-related diseases



of global water
uses are devoted
to agriculture

2,900
GALLONS

are used to
produce a pair
of blue jeans

1,857
GALLONS

are used to
produce one
pound of beef

55 
GALLONS

are used to
produce one
pound of oranges

“ The water problems of our world need not be only a cause of tension; they can also be a catalyst for cooperation... If we work together, a secure and sustainable water future can be ours.”

—Kofi Annan
February 2002

Subscribe:



ifc.org/handshake

Connect with us:



facebook.com/ifcinfrastructure



scribd.com/ifcppp



handshake@ifc.org



twitter.com/ifc_advisory

