
MODERATOR: REBECCA M. HENDERSON, Senator
John Heinz Professor of Environmental
Management, Harvard Business School

SPEAKERS: JOHN BRISCOE, Gordon McKay
Professor of the Practice of Environmental
Engineering, Harvard School of
Engineering and Applied Sciences;
Professor of the Practice of Environmental
Health, Harvard School of Public Health

BERTRAND CAMUS, CEO, Suez
Environmental N.A. and United Water

ANAND SHAH, Co-Founder and CEO,
Piramal Water Private Limited

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Chairman and CEO, Ayala Corporation

OVERVIEW

There is a huge and growing public need for access to safe water globally. Massive market need presents a potential opportunity for business, but many barriers make the space a risky place for private-sector investment.

Yet successful models do exist, including win/win public/private partnerships that accomplish society's goals in ways that are profitable for companies. For more business interests to capitalize on water opportunities, however, new paradigms and innovations in delivery models—as well as leadership in business and government—will be required.

CONTEXT

Professor Henderson led the panelists in a discussion of the business opportunities and challenges associated with expanding access to safe water.

There is a huge and growing public need for access to safe water: a potential opportunity for business.

Many view ready access to safe drinking water as a basic human right, because water is necessary to sustain life. But the ideal that water should be a free resource accessible to all contrasts starkly with practical realities. Much of the developing world today lacks 24/7 access to drinkable water.

“Water is not a business. It’s much more than that; it’s life.”

—Bertrand Camus

While the problem exists with urgency today, climate changes in coming years are bound to exacerbate it. More erratic precipitation patterns, melting glaciers, and shifts in sources of water supply will bring new supply challenges. Shrinking glaciers in the Himalayan Plateau will affect the lives of billions of people who depend on this source for agricultural and drinking water.

Population growth patterns projected over coming decades will further tax water distribution systems.

“The broader issue is a Malthusian one of having only so much water, climate change, more and more demand, and a lot of unknowns.”

—John Briscoe

Private-sector ventures in the water business tend to involve high levels of risk.

These pressing issues call for private-sector innovation. The technology already exists to improve water access, as several panelists noted. But serious issues in water supply, pricing, and the politics of water present challenges for its commercialization. Consider:

- *There are large costs associated with supplying water.* Rarely is water delivery appropriately priced relative to the capital investment required. “In the water chain, nothing is accounted for appropriately,” said Mr. Shah. Professor Briscoe noted a distinction between financial cost and opportunity cost. Recovering financial costs is essential for effective management of infrastructure. But in agriculture—the biggest water user—opportunity costs are far larger than financial costs and it is opportunity cost, not financial cost, which is key for allocative ef-

iciency. Where there are well-established, transferable water rights, market prices reflect opportunity costs. The outstanding example of these mechanisms at work is Australia. During the protracted drought market prices increased from 5 cents per cubic meter to 100 cents. Water was voluntarily re-allocated from low- to high-value uses. A 70% reduction in water availability caused little aggregate economic impact in an irrigation-based economy in the Murray Darling Basin.

- *There are large costs that people without ready water access routinely pay.* These are measured not just in financial terms but in health and longevity, time, productivity, social stability, and income inequality. People who don’t have access to safe water for drinking or agricultural needs recognize its true value. While typically poor, these people are willing to pay dearly for access to it. In that sense, there is an immense market opportunity—one often overlooked by business, given the type of communities where it exists.

“Water is not free for anyone in the world, but in places like India it’s a healthcare cost, or a productivity cost, or a longevity cost.”

—Anand Shah

- *Political/regulatory environments are often inhospitable to profitable investment in water delivery.* Water business ventures tend to be risky for private partners. A review of concession contracts show that for other utilities, such as energy, telecommunications, and transportation, only 4–5% have failed, versus 35% for water. A great deal of infrastructure capital must be tied up for the long term in uncertain geopolitical and regulatory/legal environments. Water systems often come last in the sequence of privatizations (such as in Chile), because water delivery is such a complex and sensitive business.

“Many think water should be a free resource. . . . But we have serious issues in supply [that will affect] how we price it, deliver it, and manage the politics and commercialization of water going forward.”

—Rebecca M. Henderson

Several panelists said that water was like oil in prior decades. Its challenges are not yet widely understood, but certainly call for increased public attention and innovative solutions.

Successful private-sectors models do exist, showing the power of business to address the great social need.

In Manila, an innovative public/private partnership has proven a win/win/win for:

- *The Philippines government*—which had been unable without private-sector help to provide adequate water access to much of the city’s population.
- *Manila’s people*—access to clean water 24/7 increased from 70% of the city’s population in 1997 to 100% today. There was little public opposition to paying for the service, given the great improvement in the quality of water access.
- *Ayala Corp.*—which runs a thriving water-delivery concession business thanks in part to strong political leadership from then-President Ramos, in part due to the well-structured concession agreement and regulatory process and to excellent business strategy and execution. The model allows the company to capture profits from efficiencies (Ayala lowered the percentage of non-revenue water from 63% to 11%).

“We like to think that the Philippines model is an example of how it can work, which might be applicable for other countries.”

— Jaime Augusto Zobel de Ayala

In remote Indian villages, Piramal delivers water via a unique franchise model. Local business owners sell water to their neighbors, sourced locally from water they purify using company-provided equipment. Customers purchase water in the quantities they need via prepaid cards at ATM-like kiosks, adding money to cards via cell phones, online, or at drugstores.

Professor Briscoe noted two groups of companies entering the “water space” (especially relating to growing scarcity and deteriorating quality of the resource itself) in growing numbers: 1) firms whose social license to operate is threatened by water quality or scarcity issues (which includes beverage, food, energy and chemical companies) and 2) technology solutions providers whose innovations are improving water quality (e.g., through the application

of nano-technology), productivity (e.g., developing new, more productive seeds), and management (much greater use of information technology).

To effectively address water challenges, innovation, new paradigms, and leadership will be required.

For business to capitalize on water opportunities, many areas need to be addressed—new distribution paradigms, public education, political leadership, and investment-friendly regulatory environments.

Mr. Shah believes delivery-model innovation is most urgently needed to address water supply problems. People typically think of water as a utility in the traditional sense, requiring complex and capital-intensive infrastructure such as pipelines, metering, and billing systems. Large systems like that are not financially or physically practical in remote villages in emerging markets. Required are new paradigms that consider above all the needs of the customer. “Micro-utilities” that distribute water over short distances—above the ground, where quality can be ensured—make more sense.

Mr. Shah predicts two big changes in delivery. There will be less delivery of potable water via pipes. The traditional model of pipes carrying drinkable water is inefficient; much is wasted on clothes washing, for example. Two tiers of water quality will be delivered separately. He also expects a revolution in agricultural production that will save much water. In India, 87% of water is used for farming; inexpensive new techniques like laser-leveling the land can reduce water consumption by 50%.

Panelists also mentioned as critical to effectively addressing water-supply challenges the need for:

- *Political leadership.* To attract private enterprise, governments should limit investors’ risk and enable profitability via regulatory policies, legislation, and terms of public/private partnership contracts.

- *Engagement by the private sector.* There is much technical innovation, almost all in the private sector. The private sector is also engaging in institutional innovation (witness Manila Water), which is producing results at a large scale. In some instances the private sector is partnering with willing governments to bring process innovation into once-sluggish public water-management systems.
- *Public education.* Awareness needs to be raised regarding water-supply challenges and the private-sector innovations that can address them, particularly in countries where elections replace public officials every few years.

“If we want politicians making the right decisions, we need to explain, explain, explain.”

—Bertrand Camus

Harvard Business School is helping its students reflect upon the business opportunities and innovation challenges.

The environmental crisis makes the role of business leaders more complex. They now need to manage not only their organizations but also politicians, social interests, NGOs, and more.

HBS’s new Business and Environment Initiative is exploring issues at the intersection of business and environment. The 300 students who participate are reflecting on the opportunities for business and the innovation required to meet the social and business challenges in the water space. They are figuring out ways they can play major roles in the commercialization of water. The Business and Environment Initiative is developing a partnership with the Harvard Water Program to catalyze new partnerships between business, governments, and academia.

REBECCA M. HENDERSON (MODERATOR)

Rebecca Henderson is the Senator John Heinz Professor of Environmental Management, with a joint appointment in the General Management and Strategy units. Professor Henderson is also a research fellow at the National Bureau of Economic Research. Her work concerns how organizations respond to large-scale technological shifts, most recently in regard to energy and the environment. She teaches Leadership and Corporate Accountability and the field-study seminar Building Green Businesses in the MBA Program.

From 1998 to 2009, Henderson was the Eastman Kodak Professor of Management at the MIT Sloan School of Management, where she ran the strategy group and taught courses in strategy, technology strategy, and sustainability. She received an undergraduate degree in mechanical engineering from MIT and a doctorate in business economics from Harvard.

Henderson sits on the boards of Amgen and IDEXX Laboratories, and she has worked with members of both the Fortune 100 and small, technology-oriented start-ups. She was retained by the U.S. Department of Justice in connection with the remedies phase of the Microsoft trial, and in 2001, she was named Teacher of the Year at the Sloan School. Her work has been published in a range of scholarly journals, including *Administrative Science Quarterly*, the *Quarterly Journal of Economics*, *Strategic Management Journal*, *Management Science*, *Research Policy*, the *RAND Journal of Economics*, and *Organization Science*.

JOHN BRISCOE

John Briscoe is the Gordon McKay Professor of the Practice of Environmental Engineering and Environmental Health at Harvard University, where he directs the Harvard Water Security Initiative and is on the faculties of the School of Engineering and Applied Sciences, School of Public Health, and John F. Kennedy School of Government. He teaches undergraduate and graduate courses on water management and development.

His career has focused on the issues of water, other natural resources, and economic development. He has worked as an engineer in the government water agencies of South Africa and Mozambique, as an epidemiologist at the Cholera Research Center in Bangladesh, and as a professor of water resources at the University of North Carolina. In his 20-year career at the World Bank, he held high-level technical positions (as the bank's senior water advisor) and managerial positions (country director for Brazil, the World Bank's biggest borrower).

He received his Ph.D. in environmental engineering at Harvard University in 1976 and his B.Sc. in civil engineering at the University of Cape Town, South Africa in 1969.

In addition to his native South Africa, he has lived in the United States, Bangladesh, Mozambique, India, and Brazil. He speaks English, Afrikaans, Bengali, Portuguese, and Spanish.

Briscoe has served on the Water Science and Technology Board of the National Academy of Sciences and was a founding member of the major global water partnerships, including the World Water Council, the Global Water Partnership, and the World Commission on Dams. He currently serves on the Global Agenda Council of the World Economic Forum, on the High Level Advisory Committee for the Murray Darling Basin Authority, as a member of the Council of Distinguished Water Professionals of the International Water Association, and as senior water advisor to McKinsey & Company. His recent consultancies include work for the World Bank, the Asian Development Bank, the U.S. National Intelligence Council, and the National Water Commission of Australia. In recent years, he authored the World Bank's Water Sector Strategy, the Brazil/World Bank Country Partnership Strategy, and the Oxford University Press books *India's Water Economy: Bracing for a Turbulent Future* and *Pakistan's Water Economy: Running Dry*.

BERTRAND CAMUS

Bertrand Camus serves as CEO of United Water's nationwide water and wastewater operations. These encompass both regulated and non-regulated businesses. In addition, he is CEO of Suez Environnement North America.

Prior to joining United Water, Camus served as director of internal audit for Suez Environnement, United Water's parent company. In that capacity, he was responsible for overseeing compliance within the group's operations in 30 countries around the world.

In addition to expertise in finance, long-term investment, and sustainable development, Camus has a wealth of experience in international water operations. He served as chief operating officer of Aguas Argentinas, an affiliate of Suez Environnement. In that capacity, he was responsible for overseeing water and wastewater operations, which served 8 million people living in Greater Buenos Aires.

Before joining Aguas Argentinas, Camus held various business development positions with Suez Environnement. As business development director of Southeast Asia, he was based in Kuala Lumpur, where he was involved with the development of new contracts and acquisition of companies in Malaysia, Indonesia, the Philippines, Thailand, Vietnam, and Korea. Prior to that, Camus was based in Paris where he served as director of international projects. His accomplishments included public-private partnerships in Budapest and Casablanca.

Camus began his career in project financing at Banque Nationale de Paris, where he structured and implemented funding for large infrastructure projects throughout the world.

He is a graduate of Ecole Nationale des Ponts et Chaussées, where he received a degree in civil engineering. He is also a certified internal auditor.

ANAND SHAH

Anand Shah is a co-founder and CEO of Piramal Water Private Limited, a start-up social enterprise designed to sustainably provide clean drinking water to rural villages in India. Shah came to Sarvajal, the brand under which the business operates, from the Piramal Foundation, where he served as CEO and helped incubate a number of social ventures.

American-born and a graduate of Harvard College, also fluent in Hindi and Gujarati, Shah started as a high school teacher and helped found the Match School in Boston before moving to India and helping establish a number of social impact organizations since 2001. Shah was a co-founder of Indicorps, a member of the Aspen Institute's Global Leadership Network, a TEDIndia Fellow, a former coordinator of the Club of Rome's tt30, and served on the board of several innovative organizations including Indicorps, KaosPilot International, and Unltd India.

JAIME AUGUSTO ZOBEL DE AYALA

Jaime Augusto Zobel de Ayala is chairman and CEO of Ayala Corporation, one of the largest business groups in the Philippines, with interests in real estate, telecommunications, banking, electronics manufacturing, water distribution, automotive dealerships, business process outsourcing, and overseas real estate investments. Zobel is a member of the JP Morgan International Council and the Mitsubishi Corporation International Advisory Committee. He is also chairman of the Harvard Business School Asia-Pacific Advisory Board, a member of the Harvard University Asia Center Advisory Committee, chairman of the Board of Trustees of the Ramon Magsaysay Awards Foundation, chairman of the World Wildlife Fund Philippine Advisory Council, and a member of the International Business Council of the World Economic Forum. Zobel was awarded Management Man of the Year by the Management Association of the Philippines in 2006. In 2007, he received the Harvard Business School Alumni Achievement Award, and in 2009, he was a recipient of the Presidential Medal of Merit awarded by the President of the Republic of the Philippines. He was also given the Philippine Legion of Honor with rank of Grand Commander in recognition of his outstanding public service to the country. Zobel was named Best CEO by FinanceAsia for 2009-2010.

Zobel studied at Harvard University, where he earned his BA in economics (with honors) in 1981 and his MBA in 1987.