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# Investment in Water and Wastewater Infrastructure: An Environmental Justice Challenge, a Governance Solution

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Many of the world's population are fortunate to awake each morning to find clean water both available and abundant. Water flowing from taps fills baths and cups and provides a multitude of commercial, industrial, and residential uses. These individuals consume water without fear of illness or poisoning. Clean and safe drinking water is a resource declared by the United Nations (UN) Economic and Social Council as "fundamental for life and health," "indispensable for leading a healthy life in human dignity," and a "prerequisite to the realization of all other human rights." UN Econ. & Soc. Council (ECOSOC), Comm. on Econ., Soc. & Cultural Rights, *General Comment No. 15: The Right to Water (Arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)*, ¶ 1, UN Doc. E/C.12/2002/11 (Jan. 20, 2003), available at [www2.ohchr.org/english/issues/water/docs/CESCR\\_GC\\_15.pdf](http://www2.ohchr.org/english/issues/water/docs/CESCR_GC_15.pdf). And yet, the reality is that nearly 1.1 billion people, roughly 20 percent of the world's population, do not have access to safe drinking water. WORLD HEALTH ORGANIZATION & UN CHILDREN'S FUND, *GLOBAL WATER SUPPLY AND SANITATION ASSESSMENT 2000 REPORT I* (2000), available at [www.who.int/water\\_sanitation\\_health/monitoring/jmp2000.pdf](http://www.who.int/water_sanitation_health/monitoring/jmp2000.pdf).

The women, children, and elderly in the world's poorest countries are often most adversely impacted by disparate distribution and access to potable water. The National Academy of Engineering documents that "more people die from lack of access to clean water than from war," and that in 2009 about one in six people lacked adequate access to clean water.

Access to clean water and sanitation infrastructure is essential for the planet's growing population, both from a health and economic perspective. Constructing miles of underground pipe to deliver water and convey wastewater and building hundreds of facilities to treat drinking water and remove pollutants from wastewater requires massive capital investment in countries across the globe. Given that much of this infrastructure will be needed in cash-poor developing countries and that private entities have large sums to invest in infrastructure, water infrastructure privatization has been hailed by governments, financiers, and even communities as a progressive wave of the future.

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Business realities generally require, however, that private entities obtain a reasonable rate of return on their investment. Thus, while private investment in water infrastructure does lead to the construction of critical sanitation and provides clean water to communities that previously had none, the water rates and water taxes often implemented by governments and private firms can result in regressive financial burdens on the poor. In some places in the world, the people this infrastructure is designed to serve continue to drink contaminated water, despite the availability of clean water at the tap, because they are unable to pay for water at the market rate. Similarly, rather than obtain permits or pay fees to use wastewater infrastructure, businesses continue to release chemicals and waste into public waterways.

This article evaluates the impact of the growing presence of privatized water and wastewater infrastructure projects in some of the world's most populous countries: China, India, the United States, Brazil, and Nigeria. Together, these nations account for nearly 50 percent of the world's population. The article discusses environmental justice issues associated with contaminated drinking water and insufficient sanitation and explores the role that public versus private ownership of water infrastructure plays in ensuring access to clean water for the lower-income echelons of society. It articulates the importance of the rule of law and sound environmental governance in this arena and emphasizes the role of the legal community in addressing these challenges. Although water and wastewater infrastructure privatization is a legitimate response to the costs and challenges of water treatment and distribution, environmental decision makers have an ethical and moral duty to ensure that all people have access to reliable and affordable drinking water and sanitation. As such, these authors propose solutions for bringing justice factors meaningfully into the planning, construction, and operation of water and wastewater infrastructure projects.

## ***Access to Clean Water and Sanitation: An Environmental Justice Imperative***

Lack of access to clean water is a serious global health concern. In 2005, the UN Millennium Project Report attributed 1.6 million deaths per year to unsafe water and poor sanitation, with close to 90 percent of these deaths occurring in children under five years of age. ROBERTO LENTON ET AL., *HEALTH, DIGNITY AND DEVELOPMENT: WHAT WILL IT TAKE?* 19 (2005), available at [www.unmillenniumproject.org/documents/WaterComplete-lowres](http://www.unmillenniumproject.org/documents/WaterComplete-lowres).

pdf. Although water-related deaths have significantly declined, water is still implicated in 80 percent of all sickness and disease worldwide, and waterborne diseases contribute to nearly 4 million child deaths each year. See generally Rehydration Project, Causes of Child Deaths, <http://rehydrate.org/facts/child-deaths.htm> (last visited Oct. 14, 2009); see also Rehydration Project, Ten Basic Facts about the World's Children, <http://rehydrate.org/facts/ten-facts.htm> (last visited Oct. 14, 2009). The 2006–2007 World's Water Biennial Report emphasizes that “internationally, numerous struggles over water have environmental justice implications” and that “broad trends that influence the availability and affordability of water affect marginalized communities most seriously.” PETER H. GLEICK, ET AL., *THE WORLD'S WATER, 2006–2007: THE BIENNIAL REPORT ON FRESHWATER RESOURCES* 124 (2006). Environmental injustices of inequitable water access impact communities and countries from local to international levels.

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## Despite legal frameworks declaring water a public good, China has implemented supplying water on a commercial basis.

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While water deprivation and contamination has devastating consequences on human life and health, contaminated water also causes dramatic economic losses in countries already strained by poverty due to increased health spending, productivity losses, and labor diversions. For example, in sub-Saharan Africa, such losses account for about 5 percent of national gross domestic product, roughly \$28.4 billion annually. UN DEV. PROGRAMME, *HUMAN DEVELOPMENT REPORT 2006: BEYOND SCARCITY: POWER, POVERTY, AND THE GLOBAL WATER CRISIS* 6 (2006), available at <http://hdr.undp.org/en/media/HDR06-complete.pdf>. Resource-poor countries and their marginalized populations suffer most from lack of water infrastructure and access to clean water. There are many places in the world where millions of women spend hours each day collecting water, where more than 280 million children under the age of five live in households without access to improved sanitation facilities, and where, in developing countries, 90 percent of wastewater is discharged into rivers and streams without any treatment. UN CHILDREN'S FUND, *ANNUAL REPORT 2006* (2007), available at [www.unicef.org/publications/files/Annual\\_Report\\_2006.pdf](http://www.unicef.org/publications/files/Annual_Report_2006.pdf). In the UN Millennium Project Report, then-Secretary-General Kofi Annan unequivocally stated that “no single measure would do more to reduce disease and save lives in the developing world than bringing safe water and adequate sanitation to all.” UN MILLENNIUM SUMMIT, *MILLENNIUM REPORT OF THE SECRETARY-GENERAL OF THE UNITED NATIONS* ¶ 279 (Sept. 2000).

Sustainable and healthy communities in the developing and developed world are unattainable without access to and careful

management of clean, safe drinking water and effective wastewater treatment. The World Bank predicts that by 2025, two-thirds of the world's population will suffer from lack of access to clean and safe drinking water. Without question, the world water crisis is one of the largest public health challenges of our time.

### ***Critical State of Water and Infrastructure Response: Focus on Populous Nations***

The following discussion offers a brief glimpse into the critical state of water quality and sanitation and the varying infrastructure responses around the globe in populous countries, both developing and developed.

A July 2009 U.S. government estimate pegs China's population as the largest in the world at just over 1.3 billion. Contaminated waters are a persistent social and economic challenge in China, with approximately one quarter of China's population experiencing difficulty obtaining clean water. Chinese environmental officials report that groundwater, which constitutes an estimated 70 percent of drinking water and 40 percent of agricultural irrigation water, is contaminated in approximately 90 percent of China's cities. *Official Acknowledges Serious Pollution in China, Pledging Tough Measures*, MACAU DAILY TIMES, Feb. 25, 2009, at \*1, available at [www.macaudailytimesnews.com/index.php?option=com\\_content&task=view&id=23316](http://www.macaudailytimesnews.com/index.php?option=com_content&task=view&id=23316). Alarming, China has categorized almost 30 percent of the country's river water as unsuitable for even agricultural or industrial use. Typically, when manufacturing and industrial facilities contaminate local wells, the response is to drill new wells. The new wells are quickly compromised, forcing residents to drill their own drinking water wells, while they continue to use the contaminated well water for agriculture. Individuals who dig unpermitted wells often find the water table receding or hopelessly polluted.

The Chinese government has moved to address water quality and infrastructure expansion through extensive water privatization efforts. Since the early 1990s, despite legal frameworks that declare water a public good, China has implemented a new strategy of supplying water on a commercial basis, imposing water fees or rates, and requiring state-run water companies to operate at a profit. AU LOONG YU & LIU DANQING, *THE PRIVATISATION OF WATER SUPPLY IN CHINA 2* (2006), available at [www.tni.org/books/waterchina.pdf](http://www.tni.org/books/waterchina.pdf). Yu and Danqing report, “after 15 years of neo-liberal policy on water supply, today it is clear that the only success [of China's water privatization policies] is the massive increase in market penetration and the high profits earned by water companies, at the expense of the poor.” *Id.* at 1. Communities bear the costs of extending and improving water infrastructure, and poor communities are especially burdened by regressive water-consumption taxes.

Further complicating water access is a policy that state-supplied water can be cut off when prices go up and low-income residents cannot pay the bills. In some cases, the government has closed industrial facilities responsible for water pollution, but enforcement can be impeded by localities reluctant to risk adverse impacts to tax revenues or local jobs. Yan Zhan, *China's Groundwater Future Increasingly Murky*, WORLDWATCH INSTITUTE, Nov. 28, 2006, [www.worldwatch.org](http://www.worldwatch.org).

worldwatch.org/node/4753. China's 2002 Water Law states that "in developing and utilizing water resources, attention shall first be paid to satisfying the urban inhabitants' need of water in their daily lives, while taking into consideration the need of water in agriculture, industry and ecological environment, and the need of navigation." Water Law of the People's Republic of China, ch. 3, art. 21, available at [www.ctc.mofcom.gov.cn/ciweb/tcc/info/Article.jsp?a\\_no=113624&col\\_no=689](http://www.ctc.mofcom.gov.cn/ciweb/tcc/info/Article.jsp?a_no=113624&col_no=689) (last visited Oct. 15, 2009). Affirming the principle of unified management of a collective resource, the law regulates pollution, assigns liability to polluting parties who violate pollution management plans, and proscribes private use, requiring that "no unit or individual may divert, intercept [store] or drain off water at the expense of public interests or another person's legitimate rights and interests." *Id.* art. 28. Despite this law, and the fact that nongovernmental organizations are becoming more effective via tools such as a China Water Pollution Map, which identifies violators, Yin Yueping, an expert with China's Geological Survey, notes that China's groundwater management is "about 20 years behind the world's most advanced levels." Zhan, *supra* note 12. A narrow definition of standing compounds the difficulty communities encounter when attempting to bring suits to compel compliance with environmental laws. Patti Goldman, *Public Interest Environmental Litigation in China: Lessons Learned From the U.S. Experience*, 8 Vt. J. ENVTL. L. 251, 260–62 (2007). Ultimately, both enforcement of existing environmental protections and regressibility are challenges to achieving improved environmental and human health conditions in China.

With just over 1.1 billion people, India ranks second in world population. Expansive development is accompanying this nation's population growth, yielding a nation in desperate need of increased water supply and treatment infrastructure. Access to improved sanitation is especially low in India—the Asian Development Bank estimates that 55 percent of India's population, close to 600 million people, lacks access to adequate toilets. ASIAN DEVELOPMENT BANK, *INDIA'S SANITATION FOR ALL: HOW TO MAKE IT HAPPEN 10* (2009), available at [www.adb.org/Documents/Books/Water\\_for\\_All\\_Series/Indian-Sanitation/Indian-Sanitation.pdf](http://www.adb.org/Documents/Books/Water_for_All_Series/Indian-Sanitation/Indian-Sanitation.pdf). The World Bank reports only 35 percent sanitation coverage in rural areas. See WORLD BANK, *PROJECT APPRAISAL DOCUMENT ON A PROPOSED CREDIT IN THE AMOUNT OF SDR 96.6 MILLION (U.S. \$150 MILLION EQUIVALENT) TO THE REPUBLIC OF INDIA FOR AN ANDHRA PRADESH RURAL WATER SUPPLY & SANITATION PROJECT 21–22* (2009). The lack of access to sanitation systems in both urban and rural areas creates significant waste loads, polluting already deteriorating waterbodies and creating human and environmental health hazards. See UN DEVELOPMENT PROGRAMME, *INDIA: URBAN POVERTY REPORT 2009* (2009), summary available at [www.undp.org.in/content/factsheets/PovertyReduction/INDIA-URBAN-POVERTY-REPORT-2009.pdf](http://www.undp.org.in/content/factsheets/PovertyReduction/INDIA-URBAN-POVERTY-REPORT-2009.pdf). Some policy analysts attribute India's ongoing water-management challenges to "inadequate or inappropriate water governance" and call for more stable institutional frameworks so that sustainable water-management policies can be developed. Darryl D'Monte, *Taking Stock of Watsan, INDIA TOGETHER* (Apr. 6, 2007), available at [www.indiatogether.org/2007/apr/hlt-watsan.htm](http://www.indiatogether.org/2007/apr/hlt-watsan.htm).

For both infrastructure and distributional needs, water priva-

tization has been one mechanism used by India in its attempt to address water connectivity issues. In 1992, India's 73rd Constitutional Amendment decentralized resource management responsibilities, empowering Panchayati Raj Institutions to function as "units of self-government." S.P. JAIN & WIM POLMAN, *A HANDBOOK FOR TRAINERS ON PARTICIPATORY LOCAL DEVELOPMENT: THE PANCHAYATI RAJ MODEL IN INDIA 6* (2003), available at [ftp://ftp.fao.org/docrep/fao/007/AE536e/AE536E00.pdf](http://ftp.fao.org/docrep/fao/007/AE536e/AE536E00.pdf). In 2009, the World Bank reported that the cost of water was 10 to 20 rupees per kilolitre (about 20–40 U.S. cents) while customers paid two to five rupees per kilolitre (about 2–10 U.S. cents). Citing broad disparities between past water delivery costs and water rates, the World Bank has called for improving water quality to improve customers' "willingness to pay," emphasizing appropriate technology applications and better management policies.

In response, private water companies have proliferated throughout India, offering the needed technical and economic expertise and effective system management. Their presence has been hotly contested by communities, many quite unaccustomed to speaking out, and increasing protests decrying water privatization. Widely recognized Indian ecofeminist Vandana Shiva asserts that water is by nature a "commons" and, as such, "cannot be owned as private property and sold as a commodity," stating that "no one has a right to overuse, abuse, waste or pollute water systems." VANDANA SHIVA, *WATER WARS: PRIVATIZATION, POLLUTION, AND PROFIT 36* (2002).

Perhaps in response, India is showing signs of thoughtful approaches to water. India's National Academy of Agricultural Sciences (NAAS) reports, "there is a general consensus that, (a) [the] water resource sector needs a holistic view; (b) all stakeholders need to be involved in its management; and (c) . . . there ought to be some defined principle of water allocation." NAAS claims that "the gaps between principles and practices are mainly due to factors associated with absence of clear-cut property rights and lack of governance or mis-governance in [the] water sector" and "the epicenter of the problem lies in the current social, economic, legal and governance framework of water resource development, distribution and utilization." M. VIJAYA KUMAR, *EMERGING ISSUES IN WATER MANAGEMENT: THE QUESTION OF WATER MANAGEMENT 1* (2005), available at [www.naasindia.org/Policy%20Papers/Policy%2032.pdf](http://www.naasindia.org/Policy%20Papers/Policy%2032.pdf).

As the fourth-largest nation in the world and a country with over 307 million people, the United States is not immune to water-quality and infrastructure challenges. The United States reported 100 percent safe water access to the UN Development Programme's 2007–2008 Human Development Report and WHO health indicator queries. In *Water Poverty in the United States*, however, persuasive arguments are made that, in reality, the United States has a "complex landscape of low-income water problems" and has played a declining role in domestic and international water policy programs. James L. Westcoat Jr. et al., *Water and Poverty in the United States*, 38 *GEOFORUM* 801–802 (2007). The National Science Foundation's Water and Poverty Report points out that U.S. communities of the urban homeless; remote Native American groups on reservations, in mountainous regions, and on semiarid plains; and migrant workers often do not have

access to potable drinking water and adequate sanitation systems. The report raised concerns that a 100 percent water-access statistic functions to further disempower these populations by denying that there are inequalities in accessing clean water.

Further highlighting the water-quality challenges in the United States is the recent “Toxic Waters” project, documenting the impacts of herbicides, industrial pollution, and agricultural runoff. The research found that “one in 10 Americans have been exposed to drinking water that contains dangerous chemicals or fails to meet a federal health benchmark” and that “an estimated 19.5 million Americans fall ill each year from drinking water contaminated with parasites, bacteria or viruses.” Charles Duhigg, *N.Y. TIMES*, Sept. 12, 2009, at A1, [www.nytimes.com/2009/09/13/us/13water.html](http://www.nytimes.com/2009/09/13/us/13water.html). In West Virginia, some water is too polluted with heavy metals from mining runoff to drink or bathe with. In the nation’s largest dairy states, such as Wisconsin and California, drinking water contaminated with animal waste is associated with severe infections, while in parts of New York, Rhode Island, and Ohio, combined sewer overflows continue to challenge infrastructure and water-quality goals. Drinking water in parts of New York, New Jersey, Arizona, and Massachusetts shows particularly high levels of the dry cleaning solvent tetrachloroethylene. In California, the Environmental Justice Coalition for Water found that 4 million Californians have inadequate access to clean water, calling for a fundamental restructuring of state water policies, including subsidized water rates for lower-income families and prohibiting water sales from subsidized water projects. ENVTL. JUSTICE COALITION FOR WATER, *THIRSTY FOR JUSTICE: A PEOPLE’S BLUEPRINT FOR CALIFORNIA WATER 16* (2005), available at [http://ej.issuelab.org/sd\\_clicks/download2/thirsty\\_for\\_justice\\_a\\_peoples\\_blueprint\\_for\\_california\\_water/](http://ej.issuelab.org/sd_clicks/download2/thirsty_for_justice_a_peoples_blueprint_for_california_water/).

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## In Rio de Janeiro, many water sources are too polluted for human consumption.

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The United States’ water and wastewater infrastructure is in no better shape. The U.S. Environmental Protection Agency has documented a staggering “gap,” estimating that “if investment in water and wastewater infrastructure doesn’t increase to address anticipated needs, the funding gap over the next 20 years could grow to \$122 billion for Clean Water capital costs and \$102 billion for Drinking Water capital costs.” U.S. EPA, *THE CLEAN WATER AND DRINKING WATER INFRASTRUCTURE GAP ANALYSIS 36* (2002), available at [www.epa.gov/owm/gapreport.pdf](http://www.epa.gov/owm/gapreport.pdf). In 2009, the American Society for Civil Engineers gave the United States a D– in drinking and wastewater infrastructure.

Unlike in China and India, privatization is not as significant of a trend in the United States. The National Association of Clean Water Agencies found in a 2002 study that “less than one percent of all municipal drinking water and wastewater systems

are privately operated under contract to a public agency” and that “only a handful of cities have completed a sale of their drinking water or wastewater utility assets to private concerns.” However, privatization still exists in the United States. Some cities, in an effort to manage the high cost of providing drinking water to growing populations and to maintain aging water and wastewater infrastructure, bring private companies into the picture, either through contracting out operations while retaining municipal ownership of the infrastructure assets or, less frequently, through outright transfer of the assets to the private entity.

Of the private arrangements to date, some have been successful, while others have led to problems. A 2009 report documented more than twenty examples of problematic privatized water-system management. *FOOD AND WATER WATCH, WATER AND SEWER PRIVATIZATION HAS FAILED MANY U.S. CITIES* (2009) available at [www.afsc.net/PDFFiles/Food&WaterWatchonPrivatization.pdf](http://www.afsc.net/PDFFiles/Food&WaterWatchonPrivatization.pdf). For example, Atlanta, Georgia, canceled a twenty-year, \$428 million contract with a multinational water company after four years, complaining of maintenance backlogs, delayed repairs, and inadequate emergency response capabilities. In Felton, California, residents began a six-year legal battle to reclaim their water when a private supplier sought a 74 percent rate hike.

Another growing nation facing water challenges is Brazil, which at over 198 million people ranks sixth in world population. Brazil has vast water supplies, yet recent reports indicate that 21 percent of Brazil’s population lacks in-home water connections and suggest that 70 percent of hospitalizations in Brazil are the result of water-related illnesses. Environmental justice advocates assert that water pollution is particularly problematic in highly populated urban areas; in São Paulo and Rio de Janeiro alone, approximately 30 million of Brazil’s 150 million inhabitants are impacted by water contamination. Mario Osava, *Environment-Brazil: Eye on Urban Water Pollution*, INTER PRESS SERVICE, Oct. 31, 2006, available at <http://ipsnews.net/news.asp?idnews=35308>. In São Paulo, water supplies are dangerously diminished, and in Rio de Janeiro, many water sources are too polluted for human consumption. “Contaminated drinking water is associated with about 80% of all diseases and one third of all premature deaths in Brazil, making it the most serious environmental health problem in the country.” Peter Zeilhofer et al., *GIS Applications for Mapping and Spatial Modeling of Urban-use Water Quality: A Case Study in District of Cuiaba, Mato Grosso, Brazil*, CAD. SAUDE PUBLICA, (BRAZIL NAT’L HEALTH FOUND.), Apr. 2007, available at [www.scielo.br/pdf/csp/v23n4/14.pdf](http://www.scielo.br/pdf/csp/v23n4/14.pdf). And, while Brazil has protected its watersheds from development since 1975, the Water Source Protection Act, “which restricts settlements in watershed areas, had the opposite of its intended effect: the areas were occupied illegally, which led to unregulated water and sewerage runoff,” as well as increased water-distribution and treatment costs. Osava, *supra*.

Like in the United States, today the majority of Brazil’s population continues to receive water services from public municipal or state-level utilities. See generally *Associação Brasileira das Concessionárias*, BUSINESS NEWS AMERICAS, (2009) available at [www.bnamericas.com/factfile\\_detail.jsp?idioma=1&documento=14456](http://www.bnamericas.com/factfile_detail.jsp?idioma=1&documento=14456). In 1996, however, in part to address potable water accessibility, protection, and sanitation demands, Brazil opened its previously

public water-management efforts to the private sector. As a result, private companies have committed to invest 4.5 billion reais (U.S. \$2.8 billion) in the water delivery and supply sector. Increased water taxes are regressive, causing people with the lowest incomes to pay the highest percentages of their incomes to consume potable water. Water fees are particularly high in São Paulo, Brazil's largest and most economically diverse city, where 20 cubic meters of water cost \$17 (as opposed to an average of \$11 in other Latin American countries). While Brazil's national law requires water companies to create subsidies to defray these costs, only 20,000 households are able to qualify for assistance annually. See generally, Law of Subsidies for Water Consumption and Sewage Disposal, Lei No. 18,778, de 2 Fevereiro de 1989, and the Federal Water and Sanitation Law, Lei No. 11.445 de 5 de Janeiro de 2007. Furthermore, according to a 2006 World Bank study, water tariffs in Latin America are the highest of any region in the developing world, and Brazil's household expenditures of 3 percent of household income is the second highest in Latin America. Brazil's water supply struggles exemplify the difficulty of delivering water to ever-growing populations, even in water-rich areas.

Finally, a reflection on water management in one of the world's most highly populated and generally very poor nations is worth attention—at just over 149 million people, Nigeria ranks ninth in world population. This nation bears great water woes like the countries discussed above. According to Nigeria's Water and Sanitation Summary Sheet, in 2006, water coverage of the Nigerian population was only at 47 percent, a 3 percent decline since 1996. John Gambo Laah, *Water Sanitation Summary Sheet*, WATER AND SANITATION MONITORING PLATFORM (2009) available at [http://nwi.gov.ng/userfiles/file/WS\\_Summary\\_Sheet-Nigeria.ppt](http://nwi.gov.ng/userfiles/file/WS_Summary_Sheet-Nigeria.ppt). Groundwater accounts for nearly 90 percent of drinking water in Nigeria. M. E. Offodile, *The Development and Management of Ground Water Supply in Nigeria*, (2000) available at [www.uneca.org/awich/The%20Development%20and%20Management%20of%20Ground%20Water%20for.pdf](http://www.uneca.org/awich/The%20Development%20and%20Management%20of%20Ground%20Water%20for.pdf). Many of Nigeria's water sources are polluted. Studies in 2006 documented that 33 percent of well samples had nitrate levels above WHO guidelines, municipal and rural water supplies had high levels of chloride, sulfate, nitrate, and bacterial pollution, and all eight of Nigeria's significant aquifers were polluted. S.M.A. Adelana, *Nitrate Pollution of Groundwater in Nigeria*, GROUNDWATER POLLUTION IN AFRICA (2006). In *Groundwater Pollution in Africa*, Adelana decries the significant pollution throughout Nigeria's aquifers, linking elevated concentrations of pollutants to “increased urbanization coupled with indiscriminate waste disposal, industrialization, overcrowding of cities without adequate sanitation facilities, animal husbandry and agricultural use of manure and chemical fertilizers.” As in other developing nations, water contamination in Nigeria greatly impacts human health and the environment.

Some claim Nigeria's water-pollution problem is exacerbated by ineffective environmental regulations. Emmanuel Akpabio of the Nigerian Department of Geography and Regional Planning reports that “operators and managers of water resources in the state are not guided by a set of principles and regulations, but by a set of directives and executive decisions” and that because of this, “water resource management in the state does not respond to

the principles of needs and equity, and the agencies or authorities involved are not working for the common goal of optimum accessibility because of endemic corruption and lack of standard practices.” Emmanuel M. Akpabio, *Nigeria's Water Law: How Is It Translated in the Cross River Basin?* 7 INT'L J. OF REGULATION AND GOVERNANCE 2 (2007). Additionally, the Nigerian government has a national water-supply policy that has been criticized for high tariff rates and inefficiency. According to the Polaris Institute, “the lack of quality municipal infrastructure is fueling the privatization of Nigeria's drinking water while the packaged water that is filling the gap in the public system remains unregulated and potentially unsafe for consumption.” Richard Girard, *A New Battlefield Against Water Privatization in the Global South*, POLARIS INST., June 8, 2009, available at [www.polarisinstitute.org/a\\_new\\_battlefront\\_against\\_water\\_privatization\\_in\\_the\\_global\\_south](http://www.polarisinstitute.org/a_new_battlefront_against_water_privatization_in_the_global_south). One UCLA article reports that between 1990 and 2004, urban population growth in Nigeria increased from 35 to 48 percent, while urban access to improved water sources declined from 80 to 67 percent coverage. Charisma S. Acey, *Access to Water in Nigerian Cities: Advocating for Africa's Urban Poor*, J. OF THE NIGERIAN LAWYERS ASSOC. (2006) available at [www.nigerianlawyers.org/NLAFall07Journal.pdf](http://www.nigerianlawyers.org/NLAFall07Journal.pdf).

### ***Implications of Water and Infrastructure Ownership on the Poor***

As shown in the cases of the five countries studied above, a significant barrier to clean drinking water and adequate sanitation for the world's poor is infrastructure. Without infrastructure, clean water cannot be delivered to homes and communities, and dirty water cannot be transported and treated to minimize the spread of disease and to protect water supplies. A live question in policy and legal circles, however, is which is best for people, particularly the poor—public or private ownership of the infrastructure?

The reality is that groundwater can be expensive to extract, and polluted surface waters can be expensive to treat, requiring water infrastructure beyond the reach of many developing countries. To respond to the pressing need for clean-water access, nonprofit groups have scrambled to fund emergency water-relief projects around the world. For example, in 2007 “Water For People” and its partners extended drinking water services to 108,000 people in the organization's focus countries—Bolivia, Ecuador, Guatemala, Honduras, Malawi, Nicaragua, and India—by facilitating basic resource development and providing basic technical expertise. WATER FOR PEOPLE, ANNUAL REPORT, (2007) available at [www.waterforpeople.org/pdfs/News/AR07.pdf](http://www.waterforpeople.org/pdfs/News/AR07.pdf). Countries that have not had the benefit of being selected for nonprofit projects may also apply for infrastructure funding through institutions such as the World Bank. The Canadian Broadcasting Centre's (CBC's) Water Barons Project reports that the World Bank, which funds many water-supply projects, has promoted privatization by requiring loan-recipient nations in about one-third of cases to privatize water operations in some form before receiving funds. *The Water Barons: A Look at the World's Top Water Companies*, (CBC Radio broadcast, Feb. 3, 2003), available at [www.cbc.ca/news/features/water/business.html](http://www.cbc.ca/news/features/water/business.html). Water corporations have

been documented to work closely with the World Bank to promote water-infrastructure privatization. In 1990, about 51 million people received their water from private companies, while today, that figure has grown to close to 300 million globally.

In full recognition of the fact that the needed infrastructure investments are so great in many nations, many are hailing water infrastructure privatization as a progressive wave of the future. Private water corporations may have more capital for exploitation and distribution investment as well as the potential to be more efficient than local or state government operations. Furthermore, competition between providers may spur greater technological innovations, improving water infrastructure systems and increasing water availability.

While water privatization may be a legitimate response to the challenges of water use and distribution, any solution should be grounded in the principle that all people should have reliable and affordable access to safe drinking water. Water-management policies can have significant socio-economic implications, and many human-rights activists advocate the public ownership of water resources to ensure the sustainable use of these precious, finite resource. In *Water Wars: Privatization, Pollution and Profit*, Shiva examines the historical erosion of communal water rights in favor of privatization, where corporations aggressively convert free-flowing surface and ancient subsurface waters into bottled profits. Shiva speculates that the water wars of the twenty-first century may match, or even surpass, the oil wars of the twentieth century and calls for a movement to preserve water access for all.

Of course, ownership of the infrastructure is one key element, but ownership of the resource itself is even more important. In the case of groundwater, when publicly owned, it is managed by state or local governments, and costs to obtain and treat water sources are paid by the community through use and infrastructure taxes. Private groundwater ownership is increasingly being challenged. Various groups, such as the Center for Public Integrity (CPI), are concerned that water, as a vital resource without which life cannot exist, is a public resource that cannot be privately owned in a sustainable way. Worthy of reflection is CPI's "fear that accountability will vanish, and the world will lose control of its source of life." Bill Marsden, *Cholera and the Age of the Water Barons*, CENTER FOR PUBLIC INTEGRITY, Feb. 3, 2003, available at <http://projects.publicintegrity.org/water/report.aspx?aid=44>.

### ***Rule of Law, Environmental Governance, and the Legal Community***

The water crisis demands political attention and policy reform. The Food and Agriculture Organization of the United Nations predicts that in 2025, water shortages will be more prevalent among poorer countries where resources are limited and population growth is rapid, such as the Middle East, Africa, and parts of Asia. By 2025, large urban and peri-urban areas will require new infrastructure to provide safe water and adequate sanitation. There are links between freshwater access and environmental justice:

[W]ater problems are not borne equally by humans worldwide. The majority of people who lack safe water and sanitation, and whose livelihoods are threatened by polluted water or over extraction, are predominantly poor, people of color, and indigenous people. This condition is a part of a larger pattern of "environmental discrimination" that should be remedied by pollution remediation and policy change. To create a world that is more equitable, secure and peaceful, we must address the fundamental flaws of our development path—failing to do so may lead to resource wars and exacerbated rates of avoidable deaths.

GLEICK, ET AL., *supra*.

When the resource in question is one without which life as we know it cannot continue, it is imperative upon the legal community to work towards protective water-management policies (especially groundwater policies, where such protections are lacking), to promote sustainable funding mechanisms to prevent exploitation of low-income populations via unregulated, private operation of water systems, treatment, and infrastructure. In all nations, a clear legal path for redress of water contamination could be a vital tool for all communities, especially environmental justice communities.

The rule of law plays an important role in this key area. The rule of law fosters governmental stability, accountability, and citizens' access to justice. When it comes to water, nations must have respected policies and laws to protect water as a resource. Citizens must have access to courts and decision makers to freely raise grievances. Decision-making bodies must consider the implications of the choices they make regarding water for the poor and disadvantaged members of their societies.

Environmental governance is another important element in the challenging arena of water quality and infrastructure. Currently, policy gaps foster abuse and overuse of a finite resource. Effective local, state, and national policies on the allocation and protection of water resources are needed. These policies must require sustainable management of water resources, low-impact development, and implementation of green infrastructure to promote sustainable use of water resources and facilitate increased infiltration of water into soil and groundwater. On the international level, a global policy to ensure equitable water access would go a long way to promoting holistic water management for all echelons of society.

The legal community has a unique role to play in ensuring equitable access to water for all people. Lawyers are trained in bringing people together to solve complex problems and to plan for the future. Lawyers understand and can support the rule of law and rally against corruption. Lawyers can work with injured communities to help them seek redress for environmental and public health harms. Lawyers are trained in the drafting and negotiation of complex documents that bring to life necessary infrastructure projects to foster water delivery and water treatment. In this regard, awareness of the drain on our world's water resources, the inaccessibility to clean and safe water in many places in the world, and the need for a commitment to work towards change presents a tremendous opportunity for environmental lawyers today. 🌳