

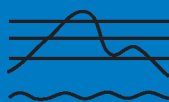
The New Economy of Water

The Risks and Benefits of Globalization and Privatization of Fresh Water



Peter H. Gleick, Gary Wolff, Elizabeth L. Chalecki, Rachel Reyes

February 2002



PACIFIC INSTITUTE
FOR STUDIES IN DEVELOPMENT, ENVIRONMENT, AND SECURITY

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Executive Summary

New voices are beginning to be heard in the debate over water, and new ideas – good and bad – considered. Among the most powerful and controversial of these new ideas is that water should be considered an “economic good” – subject to the rules and power of markets, multinational corporations, and international trading regimes.

In the last decade, this idea has been put into practice in dozens of ways, in hundreds of places, affecting millions of people.

Prices have been set for water previously provided for free. Private companies have been invited to take over the management, operation, and sometimes even the ownership of public water systems. Commercial trade in bottled water has boomed. International development agencies that used to work with governments to improve water services are now pushing privatization efforts. Proposals have been floated to transfer fresh water in bulk across international borders and even across oceans. This paper addresses these issues and concerns, and offers principles and standards to guide policymakers in the future.

We do not think the trend toward globalization and privatization of fresh water can be stopped, nor do we think it has to be. In some places and in some circumstances, letting private companies take responsibility for *some* aspects of water provision or management may help millions of poor people receive access to basic water services.

However, there is little doubt that the headlong rush toward private markets has failed to address some of the most important issues and concerns about water. In particular, water has vital social, cultural, and ecological roles to play that cannot be protected by purely market forces. In addition, certain management goals and social values require direct and strong government support and protection. Some of the consequences of privatization may be irreversible; hence they deserve special scrutiny and control.

As a result, we conclude that any efforts to privatize or commodify water must be evaluated far more carefully than they have been. Privatization efforts should be accompanied

by guarantees to respect certain principles and support specific social objectives. Among these are the need to provide for the basic water needs of people and ecosystems, permit equitable access to water for poor populations, include affected parties in decision making, and improve water-use efficiency and productivity.

Definitions

Globalization

“*Globalization*” is defined here as the process of integrating and opening markets across national borders. The entire process of globalization is highly controversial, raising great concern about national sovereignty, corporate responsibility, equity for the world’s poorest people, and the protection of the environment. The controversy extends to proposals to encourage large-scale trading of freshwater across borders. Indeed, among the most controversial water issues today are questions about how to implement – indeed, *whether* to implement – international water trading and sales.

Privatization

“*Privatization*” in the water sector involves transferring some or all of the assets or operations of public water systems into private hands. There are numerous ways to privatize water, such as the transfer of the responsibility to operate a water delivery or treatment system, a more complete transfer of system ownership and operation responsibilities, or even the sale of publicly owned water rights to private companies. Alternatively, various combinations are possible.

Commodification

“*Commodification*” is the process of converting a good or service formerly subject to many non-market social rules into one that is primarily subject to market rules.

Openness, transparency, and strong public regulatory oversight are fundamental requirements in any efforts to shift the public responsibility for providing clean water to private entities.

Water is Both a Social Good and an Economic Good

Water can be both a social and an economic good. Access to clean water is fundamental to survival and critical for reducing the prevalence of many water-related diseases. Other dimensions of water supply also have a social good character and therefore require governmental action, oversight, or regulation. Because water is important to the process of economic development, essential for life and health, and has cultural or religious significance, it has often been provided at subsidized prices or for free in many situations. In theory, though not always in practice, this makes water available to even the poorest segments of society.

Frustration over the failure to meet basic needs for water for all people in the last century has led to a rethinking of national and international water priorities and policies. Among these is the potential value of applying economic tools and principles. The International Conference on Water and Environment, held in Dublin, Ireland in January 1992, concluded, among other things, that:

“Water has an economic value in all its competing uses and should be recognized as an economic good.”

Following the Dublin meeting, the United Nations Conference on Environment and Development (held in Rio in 1992) clearly recognized that economics must play a part in efficient water management:

“Integrated water resources management is based on the perception of water as an integral part of the ecosystem, a natural resource, and a social and economic good.”

What has been far less clear is how, practically, to achieve the right balance between managing water as an economic and a social good. This has become evident in the growing debate over globalization and privatization of water worldwide.

Globalization and International Trade in Water

The world’s water is unevenly distributed, with great natural variations in abundance. Indeed, the complex and expensive water systems that have been built over the past few centuries

have been designed to capture water in wet periods for use in droughts and to move water from water-rich regions to water-poor regions. As domestic, industrial, and agricultural demands for fresh water have grown, entrepreneurs have created a wide range of markets for water, leading to various forms of international water trading and exchanges.

In the past, most large-scale transfers of water occurred within national and political borders. Agreements were also common among nations that share a watershed, such as the U.S. and Mexico over the Colorado, the Sudan and Egypt over the Nile, and many others. Now, however, proposals for bulk water transfers are being made at international, and even global, levels between parties that do not share a watershed. In recent years Alaskan, Canadian, Icelandic, Malaysian, Turkish, and other waters have been proposed as sources for international trade in bulk water. Besides the historically important environmental and socioeconomic implications of water transfers, the possibility of large-scale bulk trading of fresh water has now become an issue in international trade negotiations and disputes.

The possibility of bulk water transfers has caused concern in water-abundant regions that a global water-trading regime might lead to the requirement that abundant resources be tapped to provide fresh water for the rest of the world, at the expense of local environment and people.

The Rules: International Trading Regimes

Rules governing international trade, such as those set out by GATT, WTO, and NAFTA, are complex and often contradictory. In recent years, efforts to implement standard rules have been developed in various international forums, and these rules have become increasingly sophisticated and important to the global economy. At the same time, they have become increasingly controversial, as their implications for the environment, civil society, and local economies become clearer.

There is little legal precedent pertaining directly to international trade in water, making it difficult to predict the outcomes of current and future trade disputes in this area with certainty. However, commercial pressures to export water are increasing, making resolution of these ambiguities an important goal. In addition, adverse, even virulent public sentiment over several proposed exports highlights the need to resolve and clarify issues.

There is considerable debate among legal experts as to whether WTO member governments can control, limit, or regulate bulk water exports, and there are few legal

precedents. We believe a strong argument can be made to support banning bulk exports of water under GATT Article XX(g) where freshwater water resources are “non-renewable” or exhaustible through overuse or abuse, assuming domestic production or consumption is also limited to prevent non-renewable uses. In some circumstances, we also believe that GATT would support a ban on bulk exports of water when such exports threaten ecosystem or human health.

Our analysis also suggests, however, that profitable large-scale, long-term bulk exports of water across international borders are unlikely for many reasons, especially the high economic cost of moving water. Nevertheless, great uncertainty continues to revolve around the legal interpretation of international trade agreements in the context of globalizing water resources and we urge clarification of rules governing bulk exports of water. In particular, we recommend national water policies that explicitly protect water necessary to support human and ecosystem health and prohibit the mining and export of non-renewable water resources.

The New Economy of Water: Privatization

One of the most important – and controversial – trends in the global water arena is the accelerating transfer of the production, distribution, or management of water or water services from public entities into private hands – a process loosely called “privatization.” Treating water as an economic good, and privatizing water systems, are not new ideas. Private entrepreneurs, investor-owned utilities, or other market tools have long provided water or water services in different parts of the world. What *is* new is the extent of privatization efforts underway today, and the growing public awareness of, and attention to, problems associated with these efforts.

The issue has resurfaced for several reasons: first, public water agencies have been unable to satisfy the most basic needs for water for all humans; second, major multinational corporations have greatly expanded their efforts to take over responsibility for a larger portion of the water service market than ever before; and third, several recent highly publicized privatization efforts have failed or generated great controversy.

The privatization of water encompasses an enormous variety of possible water-management arrangements. Privatization can be partial, leading to so-called public/private partnerships, or complete, leading to the total elimination of government responsibility for water systems. At the largest scale, private water companies build, own, and operate water systems

around the world with annual revenues of approximately \$300 billion, excluding revenues for sales of bottled water. At the smallest scale, private water vendors and sales of water at small kiosks and shops provide many more individuals and families with basic water supplies than they did 30 years ago. Taken all together, the growing roles and responsibilities of the private sector have important and poorly understood implications for water and human well-being.

As a measure of the new importance of privatization, the World Bank, other international aid agencies, and some water organizations like the World Water Council are increasingly pushing privatization in their efforts, but without a common set of guidelines and principles. As a result, there is rapidly growing opposition to privatization proposals from local community groups, unions, human rights organizations, and even public water providers.

Protests – sometimes violent – have occurred in many places, including Bolivia, Paraguay, South Africa, the Philippines, and various globalization conferences around the world. Opposition arises from concerns over the economic implications of privatizing water resources, the risks to ecosystems, the power of corporate players, foreign control over a fundamental natural resource, inequities of access to water, and the exclusion of communities from decisions about their own resources. Some fundamental principles are necessary to prevent inequitable, uneconomic, and environmentally damaging privatization agreements.

The Risks of Privatization: Can and Will They Be Managed?

The move toward privatization of water services raises many concerns, and in some places, even violent opposition. In large part, opposition arises because of doubts about whether purely private markets can address the many different social good aspects of water, or whether some non-market mechanisms are necessary to serve social objectives.

Other concerns relate to a fundamental distrust of corporate players and worries about the transfer of profits and assets outside of a community or even a country. The greatest need for water services often exists in those countries with the weakest public sectors; yet the greatest risks of failed privatization also exist where governments are weak.

The rapid pace of privatization in recent years and the inappropriate ways several projects have been implemented have compounded the worries of local communities, non-governmental organizations, and policymakers.

As a result, private water companies are increasingly seeing serious and sustained public opposition to privatization proposals.

Water Provision is a Basic Responsibility of Governments

Governments have a fundamental duty to see that basic services, such as water, sewerage, and energy, are provided to their people. The failure to satisfy such basic needs, or at least provide the means to do so, must be viewed as irresponsible. Efforts of international lending agencies and development organizations have, in the past, focused on helping governments to provide these services. More recently, these organizations have begun to shift their efforts, pushing privatization as a new solution. We have serious concerns about this transfer of responsibility and the loss of control it implies.

Privatization May Bypass Under-Represented and Under-Served Communities

One of the basic goals of any proposal to provide water services (publicly or privately) should be to meet explicitly the needs of under-served communities through an expansion of access to water or wastewater services. Poor peri-urban populations have traditionally been under-served because they lack political power or representation, they come from unofficial “communities,” or they may be unable to pay as much for water as residents in wealthier areas. Privatization can potentially worsen this neglect.

Privatization Can Worsen Economic Inequities and the Affordability of Water

One of the leading arguments offered by proponents of privatization is that private management or ownership of water systems can reduce the water prices paid by consumers. Ironically, one of the greatest concerns of local communities is that privatization will lead to *higher* costs for water and water services. The actual record is mixed – both results have occurred.

One of the potential benefits of privatization is elimination of inappropriate subsidies. We note, however, that *lack* of water subsidies in some cases can have disastrous results, especially when combined with pressures to recover costs. There has been inadequate attention given in privatization negotiations and debates to identifying the difference between appropriate and inappropriate subsidies. When water systems or operations are privatized, it may be desirable to protect some groups of citizens or businesses from paying the full cost of service.

Privatization Agreements May Fail to Protect Public Ownership of Water and Water Rights

Privatization of water management can, under some circumstances, lead to the loss of local ownership of water systems, which in turn can lead to neglect of the public interest. Many of the concerns expressed about privatization relate to the control of water rights and changes in water allocations, rather than explicit financial or economic problems. In part, this is the result of the deep feelings people have for water. It is also the result, however, of serious neglect of these issues by some who promote privatization.

Privatization Agreements Often Fail to Include Public Participation and Contract Monitoring

Oversight and monitoring of public-private agreements are key public responsibilities. Far more effort has been spent trying to ease financial constraints and government oversight, and to promote private-sector involvement, than to define broad guidelines for public access and oversight, monitor the public interest, and ensure public participation and transparency. Weaknesses in monitoring progress can lead to ineffective service provision, discriminatory behavior, or violations of water-quality protections.

Inappropriate Privatization Efforts Ignore Impacts on Ecosystems or Downstream Water Users

Many privatization contracts include provisions to encourage the development of new water supplies, often over a long period of time. If privatization contracts do not also guarantee ecosystem water requirements, development of new supply options will undermine ecosystem health and well-being (for both public and private developments). Balancing ecological needs with water supply, hydroelectric power, and downstream uses of water is a complex task involving many stakeholders.

Privatization Efforts May Neglect the Potential for Water-Use Efficiency and Conservation Improvements

One of the greatest concerns of privatization watchdogs is that efficiency programs are typically ignored or even cancelled after authority for managing public systems is turned over to private entities. Improvements in efficiency reduce water sales, and hence may lower revenues. As a result, utilities or companies that provide utility services may have little or no financial incentive to encourage

conservation. In addition, conservation is often less capital intensive and therefore creates fewer opportunities for investors. Consequently, it may be neglected in comparison with traditional, centralized water-supply projects.

Privatization Agreements May Lessen Protection of Water Quality

Private suppliers of water have few economic incentives to address long-term health problems associated with low levels of some pollutants. In addition, private water suppliers have an incentive to understate or misrepresent to customers the size and potential impacts of problems that do occur. As a result, there is widespread agreement that maintaining strong regulatory oversight is a necessary component of protecting water quality. When strong regulatory oversight exists, privatization can lead to improvements in water quality.

Privatization Agreements Often Lack Dispute-Resolution Procedures

Public water companies are usually subject to political dispute-resolution processes involving local stakeholders. Privatized water systems are subject to legal processes that involve non-local stakeholders and perhaps non-local levels of the legal system. This change in *who* resolves disputes, and the rules for dispute resolution, is accompanied by increased potential for political conflicts over privatization agreements. While we strongly support the concept of standards, benchmarks, and clear contract agreements, such standards must be negotiated in an open, transparent process, with input from all parties, not just water companies.

Privatization of Water Systems May be Irreversible

When governments transfer control over their water system to private companies, the loss of internal skills and expertise may be irreversible, or nearly so. Many contracts are long term – for as much as 10 to 20 years. Management expertise, engineering knowledge, and other assets in the public domain may be lost for good. Indeed, while there is growing experience with the transfer of such assets to private hands, there is little or no recent experience with the public sector re-acquiring such assets from the private sector.

Principles and Standards for Privatization

We believe that the responsibility for providing water and water services should still rest with local communities and governments, and that efforts should be made to strengthen the ability of governments to meet water needs. As described

in this study, the potential advantages of privatization are often greatest where governments have been weakest and failed to meet basic water needs. Where strong governments are able to provide water services effectively and equitably, the attractions of privatization decrease substantially. Unfortunately, the worst risks of privatization are also where governments are weakest, where they are unable to provide the oversight and management functions necessary to protect public interests. This contradiction poses the greatest challenge for those who hope to make privatization work successfully.

Despite the vociferous, and often justified, opposition to water privatization, proposals for public-private partnerships in water supply and management are likely to become more numerous in the future. We do not argue here that privatization efforts must stop. We do, however, argue that all privatization agreements should meet certain standards and incorporate specific principles. Consequently, we offer the following Principles and Standards for privatization of water-supply systems and infrastructure.

1. Continue to Manage Water as a Social Good

1.1 Meet basic human needs for water. All residents in a service area should be guaranteed a basic water quantity under any privatization agreement.

Contract agreements to provide water services in any region must ensure that unmet basic human water needs are met first, before more water is provided to existing customers. Basic water requirements should be clearly defined (Gleick 1996, 1999).

1.2 Meet basic ecosystem needs for water. Natural ecosystems should be guaranteed a basic water requirement under any privatization agreement.

Basic water-supply protections for natural ecosystems must be put in place in every region of the world. Such protections should be written into every privatization agreement, enforced by government oversight.

1.3 The basic water requirement for users should be provided at subsidized rates when necessary for reasons of poverty.

Subsidies should not be encouraged blindly, but some subsidies for specific groups of people or industries are occasionally justified. One example is subsidies for meeting basic water requirements when that minimum amount of water cannot be paid for due to poverty.

2 Use Sound Economics in Water Management

2.1 Water and water services should be provided at fair and reasonable rates.

Provision of water and water services should not be free. Appropriate subsidies should be evaluated and discussed in public. Rates should be designed to encourage efficient and effective use of water.

2.2 Whenever possible, link proposed rate increases with agreed-upon improvements in service.

Experience has shown that water users are often willing to pay for improvements in service when such improvements are designed with their participation and when improvements are actually delivered. Even when rate increases are primarily motivated by cost increases, linking the rate increase to improvements in service creates a performance incentive for the water supplier and increases the value of water and water services to users.

2.3 Subsidies, if necessary, should be economically and socially sound.

Subsidies are not all equal from an economic point of view. For example, subsidies to low-income users that do not reduce the price of water are more appropriate than those that do because lower water prices encourage inefficient water use. Similarly, mechanisms should be instituted to regularly review and eliminate subsidies that no longer serve an appropriate social purpose.

2.4 Private companies should be required to demonstrate that new water-supply projects are less expensive than projects to improve water conservation and water-use efficiency before they are permitted to invest and raise water rates to repay the investment.

Privatization agreements should not permit new supply projects unless such projects can be proven to be less costly than improving the efficiency of existing water distribution and use. When considered seriously, water-efficiency investments can earn an equal or higher rate of return to that earned by new

water-supply investments. Rate structures should permit companies to earn a return on efficiency and conservation investments.

3. Maintain Strong Government Regulation and Oversight

3.1 Governments should retain or establish public ownership or control of water sources.

The “social good” dimensions of water cannot be fully protected if ownership of water sources is entirely private. Permanent and unequivocal public ownership of water sources gives the public the strongest single point of leverage in ensuring that an acceptable balance between social and economic concerns is achieved.

3.2 Public agencies and water-service providers should monitor water quality. Governments should define and enforce water-quality laws.

Water suppliers cannot effectively regulate water quality. Although this point has been recognized in many privatization decisions, government water-quality regulators are often under-informed and under-funded, leaving public decisions about water quality in private hands. Governments should define and enforce laws and regulations. Government agencies or independent watchdogs should monitor, and publish information on, water quality. Where governments are weak, formal and explicit mechanisms to protect water quality must be even stronger.

3.3 Contracts that lay out the responsibilities of each partner are a prerequisite for the success of any privatization.

Contracts must protect the public interest; this requires provisions ensuring the quality of service and a regulatory regime that is transparent, accessible, and accountable to the public. Good contracts will include explicit performance criteria and standards, with oversight by government regulatory agencies and non-governmental organizations.

3.4 Clear dispute-resolution procedures should be developed prior to privatization.

Dispute resolution procedures should be specified clearly in contracts. It is necessary to develop practical procedures that build upon local institutions and practices, are free of corruption, and difficult to circumvent.

3.5 Independent technical assistance and contract review should be standard.

Weaker governments are most vulnerable to the risk of being forced into accepting weak contracts. Many of the problems associated with privatization have resulted from inadequate contract review or ambiguous contract language. In principle, many of these problems can be avoided by requiring advance independent technical and contract review.

3.6 Negotiations over privatization contracts should be open, transparent, and include all affected stakeholders.

Numerous political and financial problems for water customers and private companies have resulted from arrangements that were perceived as corrupt or not in the best interests of the public. Stakeholder participation is widely recognized as the best way of avoiding these problems.

Broad participation by affected parties ensures that diverse values and varying viewpoints are articulated and incorporated into the process. It also provides a sense of ownership and stewardship over the process and resulting decisions.

We recommend the creation of public advisory committees with broad community representation to advise governments proposing privatization; formal public review of contracts in advance of signing agreements; and public education efforts in advance of any transfer of public responsibilities to private companies. International agency or charitable foundation funding of technical support to these committees should be provided.

Conclusions

As the 21st century unfolds, complex and new ideas will be tested, modified, and put in place to oversee the world's growing economic, cultural, and political connections. One of the most powerful and controversial will be new ways of managing the global economy. Even in the first years of the new century, political conflict over the new economy has been front and center in the world's attention.

This controversy extends to how fresh water is to be obtained, managed, and provided to the world's people. In the water community, the concept of water as an "economic good" has become the focal point of contention. In the last decade, the idea that fresh water should be increasingly subject to the rules and power of markets, prices, and international trading regimes has been put into practice in dozens of ways, in hundreds of places, affecting millions of people. Prices have been set for water previously provided for free. Private corporations are taking control of the management, operation, and sometimes even the ownership of previously public water systems. Sales of bottled water are booming. Proposals have been floated to transfer large quantities of fresh water across international borders, and even across oceans.

These ideas and trends have generated enormous controversy. In some places and in some circumstances, treating water as an economic good can offer major advantages in the battle to provide every human with their basic water requirements, while protecting natural ecosystems.

Letting private companies take responsibility for managing some aspects of water services has the potential to help millions of poor receive access to basic water services. But in the past decade, the trend toward privatization of water has greatly accelerated, with both successes and spectacular failures. Insufficient effort has been made to understand the risks and limitations of water privatization, and to put in place guiding principles and standards to govern privatization efforts.

There is little doubt that the headlong rush toward private markets has failed to address some of the most important issues and concerns about water.

In particular, water has vital social, cultural, and ecological roles to play that cannot be protected by purely market forces. In addition, certain management goals and social values require direct and strong government support and protection, yet privatization efforts are increasing rapidly in regions where strong governments do not exist.

We strongly recommend that any efforts to privatize or commodify water be accompanied by formal guarantees to respect certain principles and support specific social objectives. Among these are the need to provide for the basic water needs of humans and ecosystems as a top priority. Also important is ensuring independent monitoring and enforcement of water quality standards, equitable access to water for poor populations, inclusion of all affected parties in decision making, and increased reliance on water-use efficiency and productivity improvements.

Openness, transparency, and strong public regulatory oversight are fundamental requirements in any efforts to share the public responsibility for providing clean water to private entities.

Water is both an economic and social good. As a result, unregulated market forces can never completely and equitably satisfy social objectives. Given the legitimate concerns about the risks of this “new economy of water,” efforts to capture the benefits of the private sector must be balanced with efforts to address its flaws. Water is far too important to the well being of humans and our environment to be placed entirely in the private sector.

Introduction

The world is undergoing dramatic and unanticipated changes. An information and communications revolution is underway. World markets are opening up. Climatic conditions are shifting. Human populations continue to rise, bringing new threats to natural ecosystems. Economies and social systems are increasingly intertwined. And the way that water managers and policymakers think about water is changing as well.

The old approaches to addressing water problems – building large-scale dams, pipelines, and irrigation systems – brought great benefits to hundreds of millions of people, but they also had great costs. By the end of the 20th century, billions of people still struggled without access to the most basic water services – safe drinking water and adequate sanitation services. New voices began to be heard in the water debate, and new ideas – good and bad – considered.

Among the most powerful and controversial of these new ideas is that water should be considered an “economic good,” increasingly subject to the rules and power of markets, prices, multinational corporations, and international trading regimes. In the last decade, this idea has been put into practice in dozens of ways, in hundreds of places, affecting millions of people. Prices have been set for water previously provided for free. Private companies have been invited to take over the management, operation, and sometimes even the ownership of previously public water systems. Commercial trade in bottled water has boomed. International development agencies that used to work with governments to improve water services are now pushing privatization efforts. Proposals have been floated to transfer fresh water in bulk across international borders, and even across oceans.

This paper addresses these issues and concerns. We discuss the globalization, privatization, and commodification of water; define terms; review cases and examples; and offer principles and standards to guide policymakers in the future. These ideas and trends have generated enormous controversy. On the positive side, we are seeing lively and productive debates and arguments. On the negative side, people have died as a result of water-related conflicts and disputes. Many unanswered questions remain about the true implications and consequences of treating water as an economic good and whether these new approaches can effectively, equitably, and

adequately serve human and environmental needs. Controversy is building about protecting ecosystem quality and access to water. Debate is growing about how – and even whether – to price and sell a resource as fundamental and vital as water. Concern has been raised about how fresh water should be defined and treated by sweeping new

There is little doubt that the headlong rush toward private markets has failed to address some of the most important issues and concerns about water.

international trade agreements. Protests have broken out over efforts to give private multinational corporations control over local water resources.

We do not think the trend toward globalization and privatization of fresh water can be stopped, nor do we think it has to be. In some places and in some circumstances, letting private companies take responsibility for *some* aspects of water provision or management may help help millions of poor receive access to basic water services.

However, there is little doubt that the headlong rush toward private markets has failed to address some of the most important issues and concerns about water. In particular, water has vital social, cultural, and ecological roles to play that cannot be protected by purely market forces. In addition, certain management goals and social values require direct and strong government support and protection. Some of the consequences of privatization may be irreversible; hence they deserve special scrutiny and control. As a result, we conclude that any efforts to privatize or commodify water must be evaluated far more carefully than they have been and accompanied by guarantees to respect certain principles and support specific social objectives. Among these are the need to provide for basic human and ecosystem water requirements, permit equitable access to water for poor populations, include affected parties in decision making, and improve water-use efficiency and productivity. Openness, transparency, and strong public regulatory oversight are fundamental requirements in any efforts to shift the public responsibility for providing clean water to private entities. These principles are defined and summarized in this paper.

The Water Crisis: Perceived and Real

Humans have manipulated water resources since the beginning of civilization. Early agricultural communities developed where crops could be grown with dependable rainfall and perennial rivers. Simple irrigation canals improved crop production and reliability. Growing villages required increasingly sophisticated engineering efforts to bring water from remote sources and to dispose of human wastes.

During the industrial revolution and population explosion of the 19th and 20th centuries, water requirements rose exponentially. To meet these needs, engineers built tens of thousands of massive projects designed to control floods, protect clean water supplies, and provide water for irrigation or hydropower.

Improved sewer systems helped stamp out cholera, typhoid, and other water-related diseases in the richer, industrialized nations. Vast cities, incapable of surviving on limited local water local resources, have bloomed as engineers brought in water from hundreds and even thousands of kilometers away. Food production has kept pace with growing populations because of the expansion of artificial irrigation systems. Nearly one-fifth of all of the electricity generated worldwide is produced by hydroelectric turbines (Gleick 1998, 2000).

Yet despite our progress, half the world's people fail to receive the level of water services available in many of the cities of ancient Greece and Rome. More than one billion people lack access to clean drinking water. Nearly two and a half billion people do not have adequate sanitation services. Preventable water-related diseases kill an estimated ten- to twenty-thousand children each day and the latest evidence suggests that we are falling behind in efforts to solve these problems (WHO 2000). New massive outbreaks of cholera appeared in the mid-1990s in Latin America, Africa, and Asia. The number of cases of dengue fever – a mosquito-borne disease – doubled in Latin America between 1997 and 1999. Millions of people in Bangladesh and India are drinking water contaminated with unsafe levels of arsenic.

The effects of our water policies extend beyond jeopardizing human health. Tens of millions of people have been forced to move from their homes – often with little warning or compensation – to make way for the reservoirs behind new dams. More than 20 percent of all freshwater fish species are now threatened or endangered because dams and water withdrawals have destroyed the free-flowing river ecosystems where they thrive. Certain irrigation practices degrade soil quality and reduce agricultural productivity, threatening to bring an end to the Green Revolution. Groundwater aquifers

are being pumped down faster than they are naturally replenished in parts of India, China, the United States, and elsewhere.

On the Columbia and Snake Rivers in the northwestern United States, 95 percent of the juvenile salmon trying to reach the ocean do not survive passage through the numerous dams and reservoirs that block their way. More than 900 dams on almost all New England and European rivers keep Atlantic salmon from their spawning grounds, and their populations have fallen to less than one percent of historic levels. Perhaps most infamously, the Aral Sea in central Asia is disappearing because water from the Amu Darya and Syr Darya rivers that once sustained it has been diverted to grow cotton. Twenty-four species of fish formerly found in the Sea and nowhere else are now thought to be extinct. Disputes over shared water resources have led to violence and continue to raise local, national, and even international tensions.

Population growth throughout the developing world is increasing pressures on limited water supplies. Most organizations that work on water problems – from the United Nations to NGOs to local water agencies – project that the number of people facing water scarcity and shortages in the future will grow in the future, despite efforts to meet human needs.

In the last few years, however, the way we think about water has begun to change. Around the world, large water infrastructure built and operated by governments was considered vital for national security, economic prosperity, and agricultural survival. Until very recently, governments and international financial organizations like the World Bank and multilateral aid agencies subsidized or paid in full for dams or other water-related civil engineering projects, which often have price tags in the billions of dollars. Having seen large amounts of ineffective development in the past, having borne the associated costs (both monetary and otherwise) of that development, and now faced with many competing demands for limited capital, many governments are increasingly reluctant or unable to pay for new water infrastructure.

The focus is slowly shifting back to the provision of basic human and environmental needs as the top priority. To accomplish these goals and meet the demands of growing populations, previous publications from the Pacific Institute have called for smarter use of existing infrastructure rather than building new facilities, which are increasingly considered options of last, not first, resort. The challenge is to use the water we have more efficiently, to rethink our needs and wants, and to identify alternative supplies of this vital resource (Gleick 1998, 2001).

Some see the private sector and market mechanisms as a basic part of this changing paradigm. As a result, they are turning to the private sector in a variety of complex and controversial ways. In the following sections, we evaluate these approaches, review experiences in treating water as an economic good, and explore options for policymakers and the public.

Background and Definitions

Because some often-used words and phrases – *globalization*, *privatization*, *commodification*, *water as a social good*, *water as an economic good* – are critical to the discussion and analysis in this report, we explicitly define these five terms and discuss them in the context of current water management questions.

Globalization

National economies were formed in the last several centuries by intensification of trading within national boundaries, leading to economic interdependence among local economies within each nation, and increasingly among nations in a region. In a similar way, a “global” economy is now being created by the intensification of trading across national boundaries and the transnational character of large corporations, creating interdependencies among the national economies of each region and of the world. Over the past few years, new rules and processes governing trade in goods and services have been developed, leading to an expanding influence of multinational corporations and to a series of international agreements with broad implications for consumers, governments, and the natural environment.

Sidebar 1: Private and Public Goods

Economists define private goods as those for which consumption (or use) by one person prevents consumption (or use) by another. Water for consumptive use is a private good. Public goods are those that can be used by one person without diminishing the opportunity for use by others. Water-supply systems are public goods because, in most circumstances, delivery of water to one household does not prevent delivery of water to another household. The economic definitions of private and public goods should not be confused with public or private ownership of goods. A private good can be publicly owned.

These rules and processes have come to be known as “*globalization*” – defined here as the process of integrating and opening markets across national borders. The entire process of globalization is highly controversial, raising great concern about national sovereignty, corporate responsibility, equity for the world’s poorest people, and the protection of the environment. The controversy extends to proposals to encourage large-scale trading of freshwater across borders. Indeed, among the most controversial water issues today are questions about how to implement – indeed, *whether* to implement – international water trading and sales.

Privatization

“*Privatization*” in the water sector involves transferring some or all of the assets or operations of public water systems into private hands. There are numerous ways to privatize water, such as the transfer of the responsibility to operate a water delivery or treatment system, a more complete transfer of system ownership and operation responsibilities, or even the sale of publicly owned water rights to private companies. Alternatively, various combinations are possible, such as soliciting private investment in the development of new facilities, with transfer of those facilities to public ownership after investors have been repaid. Increasingly, offers to privatize water services are coming from large, multinational corporations. As these efforts intensify, so does opposition at local, regional, and international levels.

When the service being privatized has “public good” characteristics, like water, government regulation or oversight has traditionally been applied (see Sidebar 1). Economists and others argue that goods and services previously provided by public officials or agencies may become less vulnerable to political manipulation when privatized, but private entities may also become less responsive to public interests. Examples include protection of water quality, commitment to efficiency improvements that reduce the volume of water used, maintenance of basic service levels, transparent prices and billing practices, and investments in water reclamation or additional sources of water supply.

Commodification

“*Commodification*” is the process of converting a good or service formerly subject to many non-market social rules into one that is primarily subject to market rules. Even with today’s sophisticated economies, many goods and services are still traded or exchanged outside of markets. For example, villages often have complex informal social arrangements that govern access to common water supplies, rationing of these supplies during drought, and so forth. Water exchanges within the

village community or between communities may require commitments to return water in the future or other social commitments, rather than or in addition to payment in currency. Even in strong market economies, complex social rules often carry more weight than market rules. For example, some types of water rights (*e.g.*, riparian rights) are not transferable. Hence, water possessed via riparian rights is not a commodity because it cannot be marketed.

The processes of globalization and privatization tend to require that water (and water services) be treated as commodities, subject to the rules of marketplaces and free of traditional cultural rules. Of course, water in some forms is already considered a commodity, particularly bottled water of various types. In recent years, however, the sales of different forms of water have boomed, including flavored waters, glacier water, distilled and partially distilled waters, and other “designer” waters. This has led entrepreneurs to begin to explore the possibility of large-scale movements of waters for commercial, rather than purely community purposes. As the International Union for the Conservation of Nature (2000) notes: “Water, once revered for its life-giving properties, has become a commodity.”

The Nature of Water

Water Can Be Both a Renewable and a Non-Renewable Resource

In most forms, water is a renewable resource, made available by the natural hydrologic cycle of the coupled atmospheric-oceanic-terrestrial system. In this sense, continued flows of water are not affected by withdrawals and use. Unlike non-renewable resources such as coal or oil, the amount of water available for use in a basin in the future is not necessarily altered by past withdrawals of water in that basin. Not all natural waters are renewable, however, and some that are renewable can be made non-renewable through human actions. Some groundwater basins and lakes, for example, have extremely slow rates of recharge and inflow. Water extracted from these basins or bodies of water in excess of the natural recharge or inflow rate is, therefore, equivalent to pumping oil – it reduces the total stock available for later use – and hence, is non-renewable and exhaustible. Contamination of a groundwater stock, similarly, can make a renewable resource into a non-renewable resource. Finally, human actions to modify watersheds, such as cutting forests or paving land, can affect the overall hydrologic balance, reducing recharge or flow characteristics and altering timing, availability, and renewability of water. In extreme cases, this can exhaust a formerly renewable resource.

Whether a particular water resource is renewable or exhaustible is important for international trade discussions. All natural waters, therefore, cannot be treated alike. In fact, how the World Trade Organization treats them will depend on their classification as exhaustible or renewable resources; and if renewable, on the minimum flows required to sustain animal and plant life or human health. All exhaustible stocks of water may qualify as non-renewable mineral resources for exemption under GATT Article XX(g). Some renewable flows of water may qualify for an exemption under GATT Article XX (b): specifically those that are “necessary to protect human, animal or plant life or health.” These issues are discussed below.

Water is a Social Good

There is no single, universally accepted definition of social goods and services.¹ One widely used definition is that social goods are those that have significant “spillover” benefits or costs. Literacy is a social good, for example, because it benefits not just literate individuals but also makes possible a higher level of civilization for all members of a society. Widespread availability of clean and affordable water is a social good under this definition because such availability improves both individual and social well-being. Improvements in water quality for one individual means better water quality for all individuals who share that water-supply system. But social goods can have private good characteristics as well: more water for one individual can mean less water for other individuals who share a water-supply system.

Access to clean water is fundamental to survival and critical for reducing the prevalence of many water-related diseases (UN 1997). Indeed, piped water is typically one of the first community services people seek as communities develop, even before electricity, sanitation, or other basic services. Ensuring that the public receives an adequate supply of social goods requires some level of governmental action, since purely private markets often do not find it profitable to provide social goods. For example, as noted above, water quality affects public health, both in the short-term and the long-term. However, private water sellers have little or no incentive to mitigate long-term water-quality issues that do not affect the salability of the water (*e.g.*, carcinogens that do not affect the taste, odor, or appearance of water). Similarly, improvements in water-use efficiency and productivity are often economically beneficial to society as a whole, but may reduce revenues to water sellers. Completely “free” markets would not encourage private sellers to improve either water quality or water-use efficiency.

Other dimensions of water supply also have a social good character and therefore require governmental action, oversight,

¹ Economists often mean “goods and services” when they say only “goods.” We also use this convention.

or regulation. Collection, storage, treatment, and distribution of water often require large capital facilities that exhibit economies of scale. When economies of scale exist, there is a spillover benefit (lower average cost) to having a single large reservoir, for example, rather than multiple smaller reservoirs. Since privately owned and operated monopolies will maximize their profits by providing less of their product than is efficient (and thus artificially raising its price), government review and control of capital investments may be appropriate and desirable.

Modern societies usually recognize that markets will be more efficient and effective if social goods are regulated to some degree by government, and in some instances provided directly by government (*e.g.*, energy, communications, transportation, education, criminal and civil courts, police, and military forces). Furthermore, many development economists and theorists urge widespread provision of at least some social goods as a prerequisite for the transformation of poorer economies into highly productive, modern economies.

Because water is important to the process of economic development, essential for life and health, and has cultural or religious significance, it has often been provided at subsidized prices or for free in many situations. In theory, this makes water available to even the poorest segments of society. This is politically popular but brings with it a financial burden because society must pay for the subsidy. It can also encourage wasteful use of water, and the perverse result that many of the poor do not have access to clean water at reasonable prices because those who have access use more water than they need. Balancing these public and private benefits is the challenge discussed below.

Water is an Economic Good

Frustration over the failure to meet basic needs for water has been growing over the past decade after the massive effort of the International Drinking Water Supply and Sanitation Decade (1981-1990). Despite an impressive increase in the number of people with access to clean water, the number without access remains unacceptably high. During the 1990s, mobilization of the financial, engineering, and physical resources required to supply clean water to those without it was recognized to be infeasible without more efficient use of

water and a rethinking of national and international water priorities and policies. Among these was the potential value of applying economic tools and principles. Consequently, the International Conference on Water and Environment, held in Dublin, Ireland in January 1992, included the following principle among the four so-called “Dublin Principles:”

“Water has an economic value in all its competing uses and should be recognized as an economic good” (ICWE 1992).

Of the four “principles” enunciated in Dublin, this one has stirred the most debate and confusion. Water is essential for human life. Treating it solely as a commodity governed by the rules of the market implies that those who cannot afford clean water must suffer the many ills associated with its absence. However, making it available at subsidized prices can lead to inefficient use and short supply. The “needle to be threaded” in water management is how to get the most value from water that is available, while not depriving people of sufficient clean water to meet their basic needs.² The complete commodification of water, however, is not a necessary consequence of the movement toward management of water as an economic good.

What does recognition of water as an economic good mean?³ Among other things, it means that water has value in competing uses. Managing water as an economic good, broadly defined, means that water will be allocated across competing uses in a way that maximizes the net benefit from that amount of water. Allocation of water can take place through markets, through other means (*e.g.*, democratic or bureaucratic allocations), or through combinations of market and non-market processes.

A broad economic approach to water management does not inevitably lead to management of water as a commodity in all aspects. For example, water pricing that subsidizes the fixed charge portion (for the physical water connection) of water rates, but imposes a volumetric charge (for actual water used) that reflects the highest value use of water treats each unit of water consumed as a commodity, but treats the piped connection itself as a social good. This pricing scheme could

² Gleick (1996) discusses the concept of “basic needs” for water in the context of international statements and fundamental human requirements. He estimates a “basic water requirement” for domestic uses and argues that these uses should be considered essential social goods. He also notes that most people can afford to pay for basic water needs, but that when they cannot, governments should subsidize the small amounts of water involved.

³ Much has been written on this subject (see, for example, Perry et al. 1997, Rogers et al. 1998, McNeill 1998, Briscoe 1996, 1997, Garn 1998). Rogers et al., (1998) discuss this issue at length, including examples from Thailand and India. Their discussion emphasizes estimation of the costs and benefits of ecological, cultural, and social factors under current conditions. Costs and benefits can change, perhaps significantly, if property rights and rules, social preferences, technology, or institutions change.

allow the poor to satisfy their basic water needs but also reduce wasteful use of water.

What does “water will be allocated across competing uses in a way that maximizes” its value to society mean, in practice? This is where differing interpretations and vocabulary have caused, and continue to cause, considerable confusion and debate in the international water community. An example is the most useful way to see the meaning of this phrase.

Suppose that a group of fishermen can leave an additional volume of water in a river to enhance fisheries or sell that water to a nearby factory. If the factory in our example were willing to pay more than the fishermen will benefit by leaving the water in the river, the fishermen can make money by selling the water. The factory makes money after buying the water, or they wouldn't purchase it. This means that a water trade would increase the combined net benefits of water use to the fishermen and the factory. Unless there are adverse effects from the water trade on third parties, or “external costs” that haven't been accounted for (and we note that there usually *are* such costs, such as the oft-ignored ecological values of leaving the water in the river), the fishermen and factory lose, economically, if the water is not sold (allocated) to the factory. Similar logic applies if there is another party who would pay more than the factory for the water. Then the water should be sold (allocated) to that party. When all opportunities to increase net benefits by re-allocating water have been captured, water will have been “allocated across competing uses in a way that maximizes its value to society. While these principles are clear in theory, the real world is far more complex. Such transactions often entail third-party impacts, and there are many benefits of water that can never be adequately measured in economic terms. Thus, in our example above, the fishermen may never be able to assess

the true value of leaving the water in the river, affected downstream users may not be consulted about the negotiations or may be unable to voice their concerns politically, and unexpected chains of ecological impacts may result.

How Can Water Be Managed as Both a Social and an Economic Good?

Following the Dublin meeting, the United Nations Conference on Environment and Development (held in Rio in 1992) clearly recognized that economics must play a part in efficient water management:

“Integrated water resources management is based on the perception of water as an integral part of the ecosystem, a natural resource, and a social and economic good ...” (UN Agenda 21, Chapter 18.8).

The theory of allocating water across its conflicting uses, however, often conflicts with practice when there is no way to measure, or capture, all its costs and benefits. Attempting to place a market value on the social good aspects of water (*i.e.*, ecosystem and cultural values) may result in uncertain and misleading dollar value estimates. Managing water as an economic good may ultimately cause poor people or small businesses to be priced out of the market, leaving them without enough of an essential social good.

Rapid implementation of private-public partnerships for water supply has, in too many cases, blatantly disregarded the needs of the poor. That privatization or globalization of water management can harm people, however, does not imply that these processes must harm people. Furthermore, special interests have also used the appearance that the poor will be harmed by water trading or higher water prices to protect their own interests (see Sidebar 2). In Mexico, the main opposition to raising water fees comes from powerful irrigation interests, arguing that poorer farmers will suffer most. While this can be true, measures can be taken to help ensure that the proper distribution of costs and benefits occurs (Muñoz 2001).

It is also true that the rush toward a global economy and management of water as an economic good has neglected the ecological value of water (*e.g.*, from the ecosystem services provided by healthy river and coastal habitat) and its cultural value as well (*e.g.*, value associated with local control, preservation of traditional practices, or the religious significance of water). Those who approach water management from a narrow economic perspective argue that

Definitions:

Economic good: any good or service that has value to more than one person. This includes nearly all goods, including social goods. A good that is not “economic” is either without value or has value to no one but its owner.

Economic value: 1) the maximum a person is willing to pay for something they don't have, or 2) the minimum a person must receive to feel fully compensated for the loss of something. By definition, what a person is willing to pay cannot be higher than what they are able to pay.

the mistakes of the past can be addressed by more complete cost/benefit analyses, and other quantitative tools, that account for such values. Having quantified environmental, cultural, and distributional impacts, so they would argue, monetary gains from managing water as an economic good must be weighed against any adverse social impacts of managing water as an economic good. Most of those who take this approach see the economic and social good characteristics of water as incompatible.

A broader economic approach, however, recognizes that some significant benefits and costs – especially some types of cultural and ecological benefits and costs – cannot be quantified in practice. Consequently, the results of cost/benefit analysis are almost always incomplete and therefore inadequate as the sole basis for water-management decisions. The broader approach involves quantifying costs and benefits when doing so is feasible and affordable, but more importantly seeks to put into place stakeholder participation processes. The hope is that such open participation can lead to the changes in institutions (*e.g.*, formal or informal property rights and rules or organizations) that will allow water to be allocated to higher value uses through processes that are accepted as fair and equitable by stakeholders.

Once the possibility of extensive stakeholder participation leading to institutional change becomes part of the economic analysis, more opportunities to manage water as both a social and an economic good are available. In the final section of this paper we present some principles for water-management policy that can lead to simultaneous management of water as an economic and social good.

In-Situ Water Provides Ecological Benefits

Fresh water is vital to protect and maintain human, animal, and plant health, yet these benefits are rarely protected or even considered by private financial markets or trading systems. Water bodies provide habitat for aquatic life. Riparian systems provide moisture for vegetation and terrestrial biota, nutrient transport between one ecosystem and another, recreational and transportation opportunities, and aesthetic benefits. Larger systems such as the Great Lakes provide broad regional climate and weather services. Reducing water quantity or the quality of a water body by means of large-scale withdrawals or transfers may significantly alter these *in situ* benefits. Changing the timing of flows in a river, even when quality and total quantity remain unchanged, may also alter ecological conditions.

Diversions or transfers of water from watersheds to other regions have led to many ecological and human health

Sidebar 2: The Perceptions of the Affordability Problems for the Poor

An incident that occurred in the Curu Valley of Ceara, Brazil, in 1995, is an excellent example of the public's perception that management of water as an economic good will create affordability problems for the poor. In February of that year, the new president of the water resource management company announced to the press that the company was planning to impose a water tariff of US \$25 per 1,000 m³. Until that time, water had been regarded as a good that should be provided for free by the government. Public reaction to the tariff was stormy. A cartoon published in a local newspaper, reproduced below, shows the water company president stopping a poor farmer already burdened by the water he is carrying, and maliciously asking: "Wait a minute! Have you already paid the tariff?"

Ironically, the water tariffs were proposed only for large water withdrawals (2000 liters/hour or more) and the proposed tariff would have exempted the small farmer in the picture. Although it is true that small farmers and others may have been unaware of the exemption, there is evidence that the elite in this region of Brazil have in the past claimed that the region needs subsidies for the sake of the poor and the famished, while in fact subsidies have been appropriated by large landowners and politicians. Successful management of water as a social and economic good requires that the needs of the poor be addressed, and that misperceptions and disinformation be overcome (Kemper 1996).



Source: *Diário do Nordeste*, February 15, 1995.

"Wait a minute! Have you already paid the tariff?"

disasters. The diversion of water from the Amu Darya and Syr Darya rivers in Central Asia has caused the destruction of the Aral Sea ecosystem, the extinction of the Sea's endemic fish populations, the dramatic shrinking of the Sea itself, and widespread local health problems associated with the exposure and atmospheric transport of salts (see Figures 1 and 2). Withdrawals of water from many rivers and streams in North America and Europe have led to reductions and extinctions in many fish populations, particularly anadromous fish, which are born in freshwater rivers, migrate out to the open ocean, and then return to freshwater to spawn. Depletion of river flows have severely damaged river deltas and local communities, such as in the Sacramento/San Joaquin delta in California, the Nile River delta in Egypt, and the Colorado River delta in Mexico.

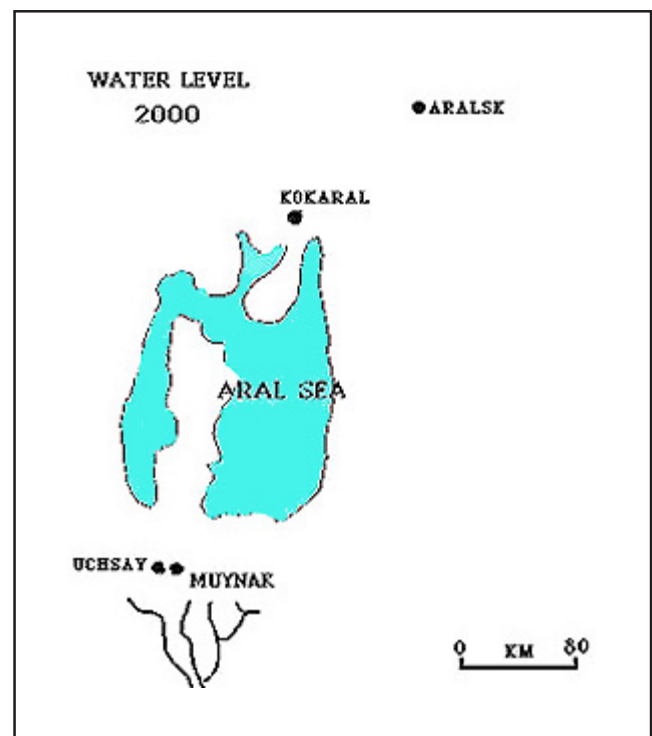
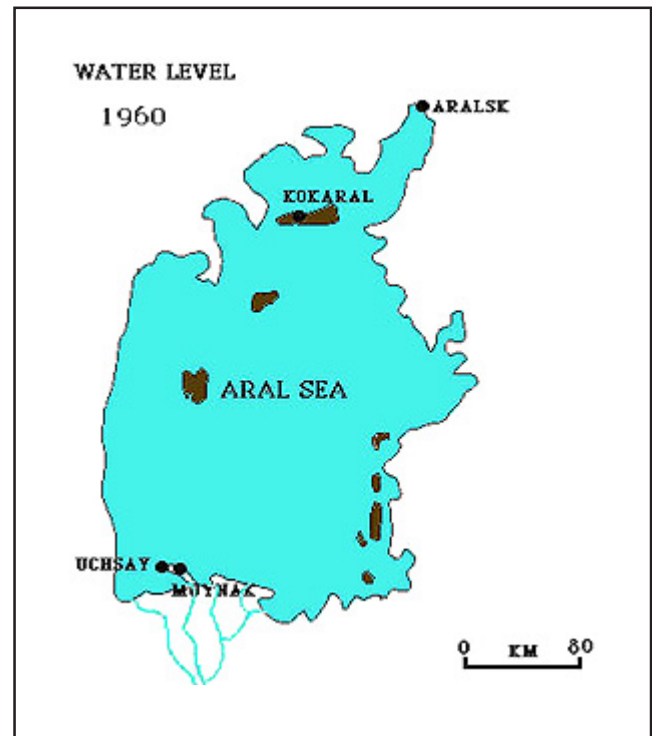
The transfer of water from one ecosystem or eco-region to another may support economic development, but it also runs the risk of contributing to or accelerating the loss of ecosystem integrity (Linton 1993) or causing adverse economic effects in the area of origin. Measuring or quantifying these benefits of water in economic terms would be necessary to incorporate them into decisions to trade, market, or manage water, yet as discussed above such measurements are complex, often incomplete and inaccurate, and hence rarely attempted. Until consistent, standard approaches to valuing *in situ* benefits of water are developed, it will be difficult to develop equitable and consistent rules governing out-of-basin transfers of water.

Water Has Moral, Cultural, and Religious Dimensions

Water has more than economic and ecological importance; it has cultural or symbolic importance as well. It figures prominently in religious rituals such as baptism and ritual bathing, and in the national identities of many native peoples (Graz 1998). Since water is so fundamental to life in all forms, deep-seated feelings may be relevant to water-management decisions. For example, strong concerns about what is fair or just may arise when water supplied to urban dwellers decreases water availability in rural areas, or when water supply to urban residents whose basic need for water is not being met is blocked to protect rural economies or natural systems.

Moral dimensions of water management intersect with the property rights issues that underlie economically efficient allocation of water. If local people "own" or have a right to water in its natural place, they must be persuaded to voluntarily accept removal of water from its natural place

for the reallocation of water to be efficient. Even when outsiders are willing to pay very large sums for water – perhaps enough to make locals extremely rich, in money terms – locals may be unwilling to voluntarily accept such trade. That is,



Figures 1 and 2: Aral Sea Extent in 1960 and 2000.

Source: http://visearth.ucsd.edu/VisE_Int/aralsea/aralanim.html.

when water *in situ* or from a particular source has cultural or symbolic significance, as well as its usual uses, it may have very different value to people of different cultures. This is perfectly rational and understandable within economic theory, as discussed further in Sidebar 3, below.

Sidebar 3: Willingness-to-Pay and Willingness-to-Accept

Economists define willingness-to-pay (WTP) as the value of something to those who don't own it at present.

Alternatively, willingness-to-accept (WTA) reflects the value of something to those who own it already. WTA is the amount one needs to be paid to voluntarily accept the loss of that thing.

In practice, the WTP of any traded good is greater than the WTA of that good; if not, sellers would not sell. When WTA exceeds WTP, buyers would not buy. Some people – most notably indigenous people or those with a deep sense of connection to the place in which they live or the customs by which they live – may feel as though no amount of money can compensate for the loss of something, such as the bulk removal of *in situ* water.

A parallel example, for oil, is that of the U'wa people of Colombia. They have stated that “there is no possible compensation” for extraction of oil from their lands. Indeed, they feel so strongly on this issue that they have vowed to commit mass suicide if oil is removed. So far, the Colombian Supreme Court has upheld their property rights in this regard, although Occidental Petroleum has been permitted to construct oil wells up to the perimeter of their tribal lands.

Hanemann (1991) has demonstrated that this type of situation is more likely to occur when the “something” in question is perceived by its owner to be unique. Water and its traditional local uses (*e.g.*, aesthetic, religious, or cultural) may be perceived as irreplaceable, and locals may therefore be unwilling to trade water for money.

Globalization: International Trade in Water

The world's water is unevenly distributed, with great natural variations in abundance. Indeed, the complex and expensive water systems that have been built over the past few centuries have been designed to capture water in wet periods for use in droughts and to move water from water-rich regions to water-poor regions. As domestic, industrial, and agricultural demands for fresh water have grown, entrepreneurs have created a wide range of markets for water, leading to various forms of international water trading and exchanges. Water has long been transferred among regions and uses via canals or pipelines, but growing demand and uncertainty of supply in the face of population growth, climate change, and other factors is motivating many states, provinces, and even individuals and corporations to examine new ways to transfer or trade water from areas with water "surplus" to areas with unmet needs. These include longer and longer pipelines, the sale of various forms of bottled water, the physical transport of liquid water in tankers or large bags towed through the ocean, and even the capture and use of icebergs.

In the past, most large-scale transfers of water occurred within national and political borders. Agreements were also common among nations that share a watershed, such as the United States and Mexico over the Colorado, the Sudan and Egypt over the Nile, and many others. Now, however, proposals for bulk water transfers are being made at international, and even global, levels between parties that do not share a watershed. In recent years Alaskan, Canadian, Icelandic, Malaysian, Turkish, and other waters have been proposed as sources for international trade in bulk water. Besides the historically important environmental and socioeconomic implications of water transfers, the possibility of large-scale bulk trading of fresh water has now become an issue in international trade negotiations and disputes.

Treating water as a good to be traded has a wide range of implications. Local concerns about the commodification and privatization of water supply include fair pricing, public accountability, environmental implications, loss of incentives for improvements in water-use efficiency, and even the religious and cultural impacts of replacing traditional water management with corporate practices developed for market economies. At the global scale, the possibility of bulk water

transfers has caused concern in water-abundant regions that a global water-trading regime might lead to the requirement that their resources be tapped to provide fresh water for the rest of the world, at the expense of their own environment and people. The overriding question that we address throughout this paper – how water can be simultaneously managed as a social and economic good – has now taken on a significant international trade dimension.

The Current Trade in Water

Proponents of trade in water argue that natural resources, such as timber, finished lumber, minerals, fossil fuels, raw fish, and agricultural goods are exported every day without generating nationalistic anti-export sentiment. Opponents of trade in water argue that water is different in important ways from other goods, including other natural resources, and that these differences require that water be treated differently in international markets. Is trade in water different in some important way from trade in other natural resource goods? If so, how should individuals, corporations, communities, countries, and even international trading agreements treat proposals to trade water?

Much of the international trade in resources involves raw natural resources that undergo some form of modification or finishing through human economic activity. Agricultural goods, livestock, fossil fuels, fish, and lumber typically involve some economic inputs, such as processing, refining, milling, or other time and labor-intensive activities. In contrast, resources traded in highly raw form, such as crude oil, logs, or raw fish, involve much less investment in the country of origin. Investments are required to acquire the resource, but little or no additional inputs are needed. Some parties to the water globalization debate argue that activities that add significant value should be treated differently, for the purpose of trade agreements and other legal protections for investors, than activities that remove raw materials from the country of origin with minimal or "one-time" benefits for the local economy.

Water can be traded as either a raw (bulk) or value-added product. Indeed, a large and rapidly growing international market already exists for various forms of processed, value-

added water – particularly bottled waters. Bottled water sales worldwide in the mid-1990s exceeded 50 billion liters and such sales have been increasing by nearly 10 percent a year since the 1970s (see Table 1). In 1999, the bottled water industry in the United States alone generated nearly \$5 billion from the sale of more than 17 billion liters – up from less than 2 billion liters annually in the mid-1970s (see Figure 3). Most of this is domestically produced – about eight percent was imported in 1999 (<http://www.soc.duke.edu/~s142tm16/world.htm>). Figure 4 shows the sources of bottled water imported into the United States. Canada, France, and Italy accounted for more than 90 percent of the U.S. imports in 1999.

Bottled water sales are also increasingly prevalent and important in poorer countries (see Table 2). We believe that bottled water sales must not be considered acceptable substitutes for adequate municipal water supply. Bottled water rarely provides adequate volumes of water for domestic use, and the costs of such water are typically exorbitant. There may be circumstances when readily available (but non-potable) water for domestic uses, plus high quality and affordable bottled water for drinking, are adequate, but we could not find any examples.

Water traded as bottled or value-added water is covered by international trade rules like any other economic good. Much of the debate and concern at present is focused on proposals to trade bulk, unprocessed water across international borders, either for later processing or for use for municipal or industrial purposes. We exclude from this discussion in-basin trades or

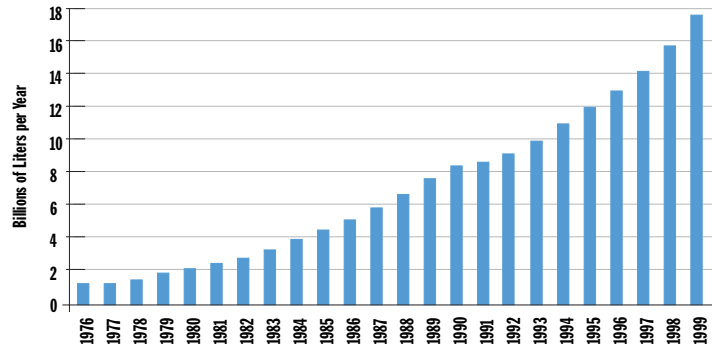


Figure 3: U.S. Bottled Water Sales. Sales of bottled water in the United States are increasing by 10 percent annually.

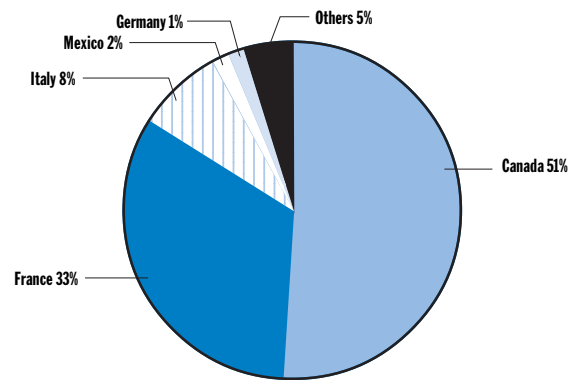


Figure 4: U.S. Bottled Water Imports in 1999. These imports represent only about eight percent of total U.S. bottled water sales. (<http://www.soc.duke.edu/~s142tm16.imports.htm>)

Table 1: Global Bottled Water Sales

Country/Region	1996 Sales (Million liters)	Projected 2006 Sales (Million liters)	Annual Percent Growth (%)
Australasia	500	1,000	11
Africa	500	800	4
CIS	600	1,500	13
Asia	1,000	5,000	12
East Europe	1,200	8,500	14
Middle East	1,500	3,000	3
South America	1,700	4,000	7
Pacific Rim	4,000	37,000	18
Central America	6,000	25,000	11
North America	13,000	25,000	4.5
Western Europe	27,000	33,000	2.5
Total	57,000	143,800	

Source: Modified from <http://www.soc.duke.edu/~s142tm16/World%20Markets.htm>

transfers of water by countries that share a watershed – such international trades occur all the time, although typically through political agreements rather than market deals.

Interestingly, there have been relatively few long-term, international, out-of-basin water trades to date, although various proposals have been put forward. On occasions, bulk water has brought by tankers to Pacific or Caribbean islands during drought to supplement limited local supplies. In the 1960s, tankers brought water to Hong Kong and loaded freshwater from the Houston River as backhaul cargo to Curaçao for use in refineries there (Meyer 2000). In the 1980s, there was a shuttle trade between the River Tees in Great Britain and Gibraltar, when Spain shut off its water supply for political purposes (Meyer 2000). Aruba imported water by tanker from Dominica. The small island nation of Nauru imported water from Australia, New Zealand, and Fiji (see Sidebar 4). In rare circumstances, such as the severe drought in mid-1994, Japan has imported limited quantities of water by tanker to maintain refinery and automobile production. This water has come from Alaska, Vietnam, South Korea, Hong Kong, and China (Sugimoto 1994, Jameson 1994, AFX News 1994, Brown et al. 1995). The provincial government of Mallorca contracted with a tanker company for shipments of water from western Spain until desalination plants could be built (Huttemeier 2000). In general, however, the very high cost of tankered water is a barrier to such

transfers, especially if long-term supplies are needed. In such situations, the maximum amount a buyer will be willing to pay does not exceed the cost of alternatives, such as desalinated water. As a result, most of these transfers are phased out when other cheaper and more reliable solutions are found.

At present, there are few major proposals pending for large-scale, long-term transfers of water across international borders (see Sidebar 5). Turkey has offered water from the Manavgat River and has been negotiating with Israel (Ekstract 2000, Turner 2001). Tankers or giant bags would transfer the water to an Israeli coastal port, where it would be treated and used. The alternative for Israel would be reallocation of existing water resources within Israel (from, for example, agriculture to cities), improvements in water-use efficiency, or new supplies from elsewhere, such as desalination. Whether the proposed bulk transfer will be able to surmount the economic and political hurdles facing it remains to be seen, but as of this writing, solicitations are being considered and negotiations are continuing on price. Similarly, Spain is considering reviving an old proposal to import water from the Rhone River with a 320-kilometer aqueduct extending from Montpellier, France to Barcelona (Financial Times 2000). If implemented, this would be the first trans-basin water deal in the European Union, but it is unlikely, even if approved, to be completed within a decade.

Table 2: Bottled and Vended Water: Urban and Rural Use

Country	Year	Source of Water	Percentage of the urban population that consumes bottled or vended water	Percentage of the rural population that consumes bottled or vended water
Angola	1996	Tanker Truck	25.2	0.8
Cambodia	1998	Vendor	16	3.5
Chad	1997	Vendor	31.5	0.5
Dominican Republic	1996	Bottled Water	37	6.3
Ecuador	1990	Tanker Truck	16	7
Eritrea	1995	Tanker Truck	30.5	1.4
Guatemala	1999	Bottled Water	25.5	7.1
Haiti	1994	Bottled Water	26	0.3
Jordan	1997	Tanker Truck	1	10.6
Libyan Arab Jamahiriya	1995	Tanker Truck	6.8	13.9
Mauritania	1996	Vendor	53	0.9
Mongolia	1996	Vendor	16	1
Niger	1998	Vendor	26.4	1.9
Oman	1993	Bottled Water	39.5	42
Syrian Arab Republic	1997	Tanker Truck	4.1	11.3
Turkey	1998	Bottled Water	14.9	1
Yemen	1997	Bottled Water	14.6	0.1

Source: WHO 2000.

Sidebar 4: Transfers of Water Out of a Watershed

International, Out-Of-Basin Transfers

Aruba (Netherlands Antilles) has received water from Dominica by tanker.

In the 1960s, Hong Kong received some water via tanker. Prior to the return of Hong Kong to China, the city received 75 percent of its potable water from China. Fifty percent was piped in from the mainland. The remaining 25 percent was piped from Lantau Island.

Nauru, an island nation located in the Central Pacific, has received as much as a third of its water as return cargo from ships exporting phosphate. The water is from Australia, New Zealand, and Fiji.

In the 1990s Tonga regularly received water by tanker and the Canary Islands imported practically all of its potable water as bottled water, before beginning to build desalination plants for local domestic and industrial use.

Unusual Domestic, Out-of-Basin Transfers

Hong Kong's islands, Lamma and Ma Wan, receive water by submarine pipeline.

St. Thomas and St. John (U.S. Virgin Islands) have received water from Puerto Rico transported by sea intermittently since 1955.

Malaysia's Penang receives some of its water from the Malaysian peninsula via submarine pipes.

China's Xiamen Island receives 50 percent of its supply from the mainland.

In the Bahamas, New Providence received an average of 21 percent of its total water supply from Andros Island from 1978-1987. The water was transported by barge. In 1987, 31 percent of the total supply was transported. The Bahamas now have about 54,000 m³/day of desalination capacity.

Mallorca receives water by tanker from the Spanish mainland, but has drawn up plans to lay underwater pipes or build a desalination plant to avoid having to bring in drinking water by tanker each summer.

Turkey sends water to Turkish Cyprus by tanker.

The smaller Fijian Islands commonly received water from the larger islands starting in the early 1970s, especially during drought periods.

Sources: Coffin and Richardson, Inc. 1981, Water Supplies Department 1987, Zhang and Liang 1988, Fiji Country Paper 1984, Gattas 1998, Gleick 2000, Lee Yow Ching 1989, Swann and Peach 1989, Huttemeier 2000, Brewster and Buros 1985, Lerner 1986, Jacobson and Hill 1988, UNESCO 1992, Meyer 2000.

Sidebar 5: International, Out-of-Basin Transfers Under Consideration

Italy is considering importing water to its dry southern regions by building a pipeline under the Adriatic Sea to pump in supplies from Albania.

In October 2000, Austria claimed that it could supply all 370 million people in the European Union with well or surface water needing treatment, just ahead of EU plans to liberalize its water industry. Austrian ministers, including the agricultural and environmental minister, argue the economic advantages outweigh the political liabilities.

Spain is considering importing water from the Rhone River with a pipeline extending from Montpellier, France to Barcelona.

Israel is negotiating to buy water from Turkey's Manavgat River. Negotiations will include an Israeli request for an annual amount of 15-25 million cubic meters of water with the possibility of doubling the amount for a period of 5-10 years. Israel sees Turkish water imports as a quick alternative to its plans to build a desalination plant. Water would be shipped from the Manavgat, in south-western Turkey, to the Israeli port of Ashkelon, where it could be further distributed.

Sources: Boulton and Sullivan 2000, Rudge 2001, Demir 2001, Financial Times 2000.

International Trading Regimes

Rules governing international trade are complex and often contradictory. In recent years, efforts to implement standard rules have been developed in several international fora, and these rules have become increasingly sophisticated and important to the global economy. At the same time, they have become increasingly controversial, as their implications for the environment, civil society, and local economies become clearer. In this section we discuss two important agreements as they relate to the globalization of water resources: the General Agreement on Tariffs and Trade (GATT) and the 1994 North American Free Trade Agreement (NAFTA). GATT is the overriding international trade agreement, and NAFTA is an excellent example of how the international water trading debate has been influenced by a regional trade agreement. Other regional trade agreements have been signed or are being negotiated, and future assessments might consider these in more detail. For example, General Agreement on Trade in Services (GATS), which came into force in January 1995, is the only set of multilateral rules covering international trade in services, which could be particularly relevant for efforts to privatize water, discussed later in this report (see Sidebar 6).

GATT provides the basic legal architecture that governs international trade for the more than 140 member countries of the World Trade Organization (WTO). NAFTA governs trade in goods between the United States, Canada, and Mexico. While the two trade regimes have many similarities, there are also several provisions, described below, that distinguish the two. For the discussion about water, NAFTA is particularly important among the regional trade regimes because it includes the United States, the largest national economy in the world, and Canada, the nation that has expressed the greatest concern and taken the strongest actions with regard to international bulk water trading.

It is worth noting at the outset that there is little legal precedent pertaining directly to international trade in water, making it difficult to predict the outcomes of current and future trade disputes in this area with certainty. However, commercial pressures to export water are increasing, making resolution of these ambiguities an important goal. In addition, adverse, even virulent public sentiment over several proposed exports highlights the need to resolve and clarify issues (Barlow 1999, FTGWR 2001: Vol.127).

The degree to which countries will be able to impose controls on the exportation of water will hinge upon the determination of whether bulk water in its natural state is considered a “product,” and if so, whether exemptions in the trade

agreements are applicable. Treating water as a product (a good) on the global market typically implies that transfers will be governed by international trading obligations. This has raised concerns among local communities and environmental groups that water resources may suffer the fate of other global common resources: overexploitation with significant restrictions on national environmental control and restraints. For example, some trade analysts interpret WTO and NAFTA rules as requiring that water must *continue* to be traded in bulk once it has *begun* to be traded. These issues are discussed below.

The General Agreement on Tariffs and Trade (GATT)

GATT is a comprehensive international trade agreement and provides the basic legal structure that governs international

Sidebar 6: The General Agreement on Trade in Services (GATS)

The GATS covers all internationally-traded services with two exceptions: services provided to the public in the exercise of governmental authority, and, in the air transport sector, traffic rights and all services directly related to the exercise of traffic rights. The GATS also defines four ways in which a service can be traded:

- services supplied from one country to another (*e.g.*, international telephone calls), officially known as “cross-border supply;”
- consumers from one country making use of a service in another country (*e.g.* tourism), officially known as “consumption abroad;”
- a company from one country setting up subsidiaries or branches to provide services in another country (*e.g.*, a bank from one country setting up operations in another country), officially known as “commercial presence;” and
- individuals travelling from their own country to supply services in another (*e.g.*, an actress or construction worker), officially known as “movement of natural persons.”

Source: http://www.wto.org/english/tratop_e/serv_e/gats_factfiction1_e.htm

trade for members of the World Trade Organization (WTO). All potential commodities are defined and described in the “Harmonized Tariff Schedule” (HTS). This schedule, used by the United States and all WTO countries, includes water of all kinds (other than seawater, which is described in a separate heading) under Section 2201 (Appleton 1994).

2201.90.0000: Other waters, including natural or artificial mineral waters and aerated waters, not containing added sugar or other sweetening matter nor flavored; ice and snow.

The existence of an HTS number means that there is a mechanism under which shipments of fresh water can be processed by U.S. Customs and comparable customs organizations of other nations.

Some communities and environmental groups are concerned that if bulk water is traded as a product anywhere in the international community, GATT Article XI, “General Elimination of Quantitative Restrictions” would be interpreted to prohibit export bans by any country choosing to sell bulk water. Article XI, Section 1 states:

No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licences or other measures, shall be instituted or maintained by any contracting party on the importation of any product of the territory of any other contracting party or on the exportation or sale for export of any product destined for the territory of any other contracting party.

Once bulk water transfers are initiated by domestic industry, Article XI plays a significant role in constraining WTO member governments’ ability to establish policies, programs, or legislation that regulate, curtail, or eliminate such transfers. However, the language of the agreement is unclear as to whether these restrictions apply only to specific, actual bulk water trades once they have begun or apply to all potential bulk water trading arrangements once trade in bulk water has begun between any WTO signatories.

Under either interpretation, however, other portions of GATT appear to be relevant to the question of whether some trade in bulk water may be limited or constrained by national laws, and hence exempt from the Article XI provisions. For bulk water, the two most relevant clauses upon which a government could base an exemption and adopt measures that restrict trade are found in Article XX:

Article XX (b) necessary to protect human, animal or plant life or health;

Article XX (g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption;

There is considerable debate among legal experts as to whether WTO member governments can control bulk water exports based on these resource conservation principles, and there are few legal precedents. The WTO has struck down two previous cases where national governments attempted to challenge unlimited resource trades using these exemptions (WCEL 1999). In the 1991 Tuna-Dolphin case and the 1998 Shrimp-Turtle case, the WTO expert panels (“arbitration committees” appointed individually for each trade dispute) did not accept domestic environmental protection legislation as a valid basis for imposing trade restrictions (see Sidebar 7). Some WTO member countries such as South Africa, Angola, Ecuador, Chile, and Indonesia have publicly stated during a recent WTO High-Level Symposium on Trade and Environment that environmental protection measures should not stand in the way of economic development (IISD 1999). The burden of proof that an environmentally based trade restriction is necessary rests on the country imposing the restriction (French 1999).

Because bulk water, unlike petroleum or minerals, can be a renewable resource depending upon the way it is extracted, some may argue that it falls outside the Article XX(g) exemption. The exemption appears to have been drafted with reference to “mining” of minerals and fossil fuels, but water also has non-renewable characteristics well understood by hydrologists. As noted in Gleick (1998),

“Freshwater resources typically are considered renewable: they can be used in a manner that does not affect the long-term availability of the same resource. However, renewable freshwater resources can be made non-renewable by mismanagement of watersheds, overpumping, land subsidence, and aquifer contamination. Water policy should explicitly protect against these irreversible activities” (Gleick 1998, p.576, italics added).

Thus, this exemption could be interpreted to apply to stocks of water that were deposited long ago and are not being replenished at a significant rate compared with the rate of use. In such circumstances, a strong argument can be made to support an Article XX(g) exemption for bulk water resources where freshwater water resources are “non-renewable” or exhaustible through overuse or abuse,

Sidebar 7: The Turtle and Dolphin WTO Cases: Relevant for Water?

In two separate cases related to protection of ocean resources, WTO expert panels rejected protection of dolphins and turtles through import restrictions against tuna and shrimp from countries that did not require their boats to use dolphin- or turtle-safe nets. The WTO argued that import restrictions on the basis of the process of production of imported goods were in violation of GATT. Applying this reasoning to possible bulk water trade restrictions might suggest that prohibiting trades that undermine ecological values or human access to water at the area of origin would also be in violation of GATT. In the 1998 Shrimp/Turtle case, however, the United States changed the method of enforcement to allow shrimp from any member country as long as they could be shown to have come from boats that do use turtle-safe nets. In June of 2001, the WTO upheld this new interpretation (Lazaroff 2001).

The tuna/dolphin and shrimp/turtle cases both involved import rather than export restrictions, which are explicitly prohibited. In both cases, the importing country was trying to influence management of natural resources beyond its borders. The concerns raised in the case of bulk water trading are associated with the power of the nation of origin to protect people or ecological functions within their own borders. It is possible that the tuna/dolphin and shrimp/turtle legal precedents would not greatly influence a case involving bulk water export controls imposed by the nation of origin, but this is speculative without an actual test case under GATT. See the further discussion in the text.

assuming domestic production or consumption is also limited to prevent non-renewable uses.

There are many examples of groundwater overdraft, where human extraction exceeds natural replenishment, sometimes by a wide margin. Table 3 lists some major groundwater aquifers where annual withdrawals approach, or even exceed, annual recharge. Similar aquifers must therefore be considered “non-renewable” just as stocks of oil are considered exhaustible. In the case of exports of water from the Great Lakes of North America, some have argued that only a tiny fraction of the lakes are “renewable” and that the vast bulk of the stored water was laid down in geologic times (Barlow 1999). In such circumstances, exports could, if large enough, lead to the irreversible decline in lake levels. In 1999, the International Joint Commission between the United States and Canada issued a report concluding that the Great Lakes are non-renewable, with an eye to ensuring that they would be subject to a GATT Article XX exemption (International Joint Commission 2000). Cases where water stocks have been contaminated by human actions also represent the conversion of renewable water resources into a non-renewable resource – appropriate for an Article XX(g) exemption.

In some circumstances, bulk water exports could also be subject to an Article XX(b) exemption if such exports threaten human or ecosystem health. Biologists and ecologists have long understood and demonstrated that some amounts of water are needed *in situ* to protect animal and plant life and health, although the precise quantities needed to maintain adequate instream flows and *in situ* resource values are subject to study and debate. Many specific instream flow requirements have been set for particular watersheds to maintain ecosystem health. Although a specific Article XX(b) exemption has not been tested in the context of bulk water, we believe that it would also support a ban on bulk exports of water when such exports threaten ecosystem or human health.

Table 3: Some Heavily Exploited Aquifers of the World

Region	Aquifer	Average Annual Recharge (km ³ /yr)	Average Annual Use (km ³ /yr)
Algeria/Tunisia	Saharan basin	0.58	0.74
Saudi Arabia	Saq	0.3	1.43
China	Hebei Plain	35	19
Canary Islands	Tenerife	0.22	0.22
Gaza Strip	Coastal	0.31	0.50
United States	Ogallala	6 to 8	22.2
United States	selected Arizona	0.37	3.78

Source: Margat 1996.

The North American Free Trade Agreement (NAFTA)

Canada, the United States, and Mexico have developed the North American Free Trade Agreement (NAFTA) as a regional extension of GATT in many ways. For example, the Harmonized Tariff Schedule of the United States and the Canadian Customs Tariff, in which “ordinary natural water of all kinds” are classified under tariff heading 22.01, also implies that water can be traded internationally as a good. Article 201(1) of NAFTA defines a “good” as a “domestic product as these are understood in the [GATT] or such goods as the Parties may agree, and includes originating goods of that Party” (Yaron 1996). Hence the categorization of water provided above (HTS Number 2201.90.0000) is applicable under NAFTA as well as GATT.

Several other factors, however, complicate the interpretation of NAFTA rules for water. In 1993, the three NAFTA parties signed a joint declaration to provide explicit protection for *in-situ* water resources and the rights of the country of origin under NAFTA and GATT:

Unless water, in any form, has entered into commerce and becomes a good or product, it is not covered by the provisions of any trade agreement, including the NAFTA. And nothing in the NAFTA would obligate any NAFTA Party to either exploit its water for commercial use, or to begin exporting water in any form. Water in its natural state, in lakes, rivers, reservoirs, aquifers, water basins and the like is not a good or product, is not traded, and therefore is not and never has been subject to the terms of any trade agreement.

This joint declaration is the clearest exposition of the intent of the parties to NAFTA to protect natural waters from uncontrolled bulk withdrawals for international trade. But there is disagreement about the extent to which such declarations are binding forms of international law. Some analysts argue that the protections offered by joint declarations are not legally binding and establish no legal obligations.

“It has long been recognized in international practice that governments may agree on joint statements of policy or intention that do not establish legal obligations...These documents are sometimes referred to as non-binding agreements, gentlemen’s agreements, joint statements or declarations.” (Shrybman 1999a).

At the same time, such declarations can fall under customary law, which can be binding. The 1993 joint declaration has received little subsequent formal support from the three governments (Shrybman 1999a), and the sentiment expressed could be considered inconsistent with GATT and NAFTA tariff headings, “U.S. Law,” and “International Law,” both of which define water as a good (Shrybman 1999a). Official U.S. policy in this area was further confused when then-U.S. Trade Representative, Mickey Kantor wrote in 1993:

“...when water is traded as a good, all provisions of the agreements governing trade in goods apply...”

On the one hand, Kantor’s statement appears to be a simple reiteration that bulk water, once it has entered trade, must be subject to the existing trade agreements. But some are concerned that Kantor’s statement could be interpreted as saying that the joint declaration would no longer apply once **any** NAFTA signatory government permits sale in bulk of any water for commercial purposes (Barlow 1999). This interpretation would put bulk water back into the realm of “goods to be traded,” something environmentalists were hoping the joint declaration specifically and permanently excluded. A less extreme interpretation would be that the signers intended to exempt water in its natural state from trade agreement provisions, except for specific quantities of water that have been put into commerce with the approval of the country of origin. Under this interpretation not **all** waters become open to such trade provisions once **some** water has been traded. Under either interpretation, however, trade analysts agree that once international trade in bulk water has begun, at least the amount of water that has been authorized for trade cannot be withdrawn from trade by an action of the country of origin unless specific exemptions within GATT or NAFTA are satisfied.

The Canadian government took action to prevent bulk water trading in 1994 because it was concerned that its NAFTA obligations could impinge upon its ability to develop national water policy. On January 1 of that year, the North American Free Trade Implementation Act was proclaimed into force by the Canadian Parliament,¹ including a rider that specified that 1) nothing in either NAFTA or its implementing legislation, except the provision on tariff elimination, applied to water, and 2) “water” in this context meant natural surface and ground water in liquid, gaseous or solid state, not including water packaged as a beverage or in tanks. As appealing as this definition is for environmental and public interest groups looking to forestall bulk exports, it is a matter

¹ The implementing legislation of all signatory states came into force on January 1, 1994.

of Canadian domestic legislation and may not be binding on NAFTA dispute resolution panels (Appleton 1994). In February 1999, the government of Canada requested that each province implement a voluntary moratorium on bulk exports, but the federal government has yet to enact a national ban. Indeed, in spring 2001, the premier of Newfoundland called for lifting the ban on bulk water exports, reopening the contentious debate there (MacDonald 2001).

As noted earlier, whether fresh water *in situ* falls under NAFTA's (or the GATT's) definition of a good has not been legally settled. If, however, bulk fresh water is considered a good under the NAFTA definition, there are three conditions of NAFTA that affect international trade. First, similar to GATT Article III, "National Treatment," each signatory country must accord businesses and investors from the other signatory countries the same preferential treatment that it accords its own businesses and investors for both goods and services. Article 1102, "National Treatment" states:

Each Party shall accord to investors of another Party treatment no less favorable than that it accords, in like circumstances, to its own investors with respect to the establishment, acquisition, expansion, management, conduct, operation and sale or other disposition of investments.

This means that any NAFTA country cannot treat other NAFTA bulk water exporters or importers any differently than it treats its own bulk water exporters or importers.

Second, NAFTA Chapter 11 also allows investors in any signatory country to sue the government of either of the other two signatories if that government takes some future action (usually legislation) to "expropriate" that company's profits (Barlow 1999). According to the provisions of Article 1110, "Expropriation and Compensation":

No Party shall directly or indirectly nationalize or expropriate an investment of an investor of another Party in its territory or take a measure tantamount to nationalization or expropriation of such an investment ("expropriation"), except:

- (a) for a public purpose;*
- (b) on a non-discriminatory basis;*
- (c) in accordance with due process of law and the general principles of treatment provided in Article 1105; and*
- (d) upon payment of compensation in accordance with paragraphs 2 to 6.*

Chapter 11 issues have already been raised in the context of bulk water exports. In the fall of 1998, a Santa Barbara, California company called Sun Belt Water, Inc. sued the government of Canada under NAFTA Chapter 11. Sun Belt lost a contract to export water to California when the British Columbia (B.C.) provincial government banned bulk water exports in 1995 (Shrybman 1999b). While the Chapter 11 suit cannot overturn the B.C. law, it can make the government of Canada liable for the profits that Sun Belt would have made on this contract had B.C. not passed its export ban. This makes federal, state, and provincial governments reluctant to implement legislation regulating commerce in natural resources.

We note that while the government of Canada may be liable under these provisions of NAFTA, the profits Sun Belt might have actually received are highly uncertain – indeed, an argument can be made that any profits were unlikely. Water is very expensive to move from one place to another, and commands a high price only in the luxury form of bottled water – a form of water all participants in this debate agree is already covered by trading rules. Moreover, the amount that potential importers are willing to pay is capped at the cost of alternative sources, including desalination, making the size of possible profits highly speculative. Even assuming the sellers could command a price of \$1.50 per cubic meter – more than double what most municipalities and industries currently pay for reliable urban supplies – optimistic tankering costs for water are between \$2 and 4 per cubic meter or even higher (Bardelmeier 1995, Huttemeier 2000), depending on distance. This is why, historically, contracts to tanker water from one place to another have consistently given way to more local solutions, such as reallocation among end users, or desalination. Hence the size of the actual liability to Canada may be small or zero. This issue remains to be resolved.

Third, NAFTA Article 309 states that constraints on exports of any good must be shared proportionally across the signatory countries (Barlow 1999). This means that if Canada were to start exporting water in bulk and subsequently faced a drought or other shortage, it could not reduce the amount of water exported to the United States and Mexico in order to maintain *unreduced* deliveries to domestic customers. All customers must take proportional reductions; this is a de facto extension of the "national treatment" clause, wherein all customers are treated equally. These provisions reinforce the constraint on national sovereignty that arises under GATT: once bulk water is traded as a good under legally valid contracts, it must continue to be traded. This alarms many environmentalists who feel that the best method of protection for natural resources on a watershed scale is domestic legislation.

In sum, our analysis suggests that large-scale, long-term bulk exports of water across international borders are unlikely for many reasons, especially the high economic cost of moving water.

Nevertheless, great uncertainty continues to revolve around the legal interpretation of international trade agreements in the context of globalizing water resources. Because of the risk of ecological damages and non-sustainable withdrawals of water for export, we urge clarification of rules governing bulk exports of water. In particular, we recommend national water policies that explicitly protect water necessary to support human and ecosystem health and prohibit the mining and export of non-renewable water resources.

Privatization of Water

“Food and water are basic rights. But we pay for food. Why should we not pay for water?” *Ismail Serageldin at the Second World Water Forum, The Hague*

“Water should not be privatized, commodified, traded or exported in bulk for commercial purposes.” *Maude Barlow, International Forum on Globalization*

“...the purpose of government is to make sure services are provided, not necessarily to provide services.” *Mario Cuomo*

One of the most important – and controversial – trends in the global water arena is the accelerating transfer of the production, distribution, or management of water or water services from public entities into private hands – a process loosely called “privatization.” Treating water as an economic good, and privatizing water systems, are not new ideas. Private entrepreneurs, investor-owned utilities, or other market tools have long provided water or water services in different parts of the world. What *is* new is the extent of privatization efforts underway today, and the growing public awareness of, and attention, to problems associated with these efforts.

The issue has resurfaced for several reasons: first, public water agencies have been unable to satisfy the most basic needs for water for all humans; second, major multinational corporations have greatly expanded their efforts to take over responsibility for a larger portion of the water service market than ever before; and third, several recent highly publicized privatization efforts have failed or generated great controversy.

The privatization of water encompasses an enormous variety of possible water-management arrangements. Privatization can be partial, leading to so-called public/private partnerships, or complete, leading to the total elimination of government responsibility for water systems. At the largest scale, private water companies build, own, and operate water systems around the world with annual revenues of approximately \$300 billion, excluding revenues for sales of

bottled water (Gopinath 2000). At the smallest scale, private water vendors and sales of water at small kiosks and shops provide many more individuals and families with basic water supplies than they did 30 years ago. Taken all together, the growing roles and responsibilities of the private sector have important and poorly understood implications for water and human well-being.

As a measure of the new importance of privatization, the second World Water Forum in the Hague in March 2000 gave special emphasis to the need to mobilize new financial resources to solve water problems and called for greater involvement by the private sector. Indeed, the “Framework for Action” released at that meeting called for \$105 billion per year in new investment – over and above the estimated \$75 billion per year now spent – to meet drinking water, sanitation, waste treatment, and agricultural water needs between now and 2025. The Framework called for 95 percent of this new investment to come from private sources (GWP 2000). There was enormous controversy at this meeting about the appropriate role of governments and non-governmental organizations, and a planned public workshop and discussion on privatization and globalization of water was cancelled. In addition, the World Bank, other international aid agencies, and some water organizations like the World Water Council are increasingly pushing privatization in their efforts, but they lack a common set of guidelines and principles.

Along with the growing efforts at water privatization, there is rapidly growing opposition among local community groups, unions, human rights organizations, and even public water providers. Protests – sometimes violent – have occurred in many places, including Bolivia, Paraguay, South Africa, the Philippines, and various globalization conferences around the world. Opposition arises from concerns over the economic implications of privatizing water resources, the risks to ecosystems, the power of corporate players, foreign control over a fundamental natural resource, inequities of access to water, and the exclusion of communities from decisions about their own resources. This report reviews why efforts are growing to turn over responsibility for public provision of water and water services to the private sector,

the history of privatization efforts, and the risks of these efforts. We also offer some fundamental principles that we believe are necessary to prevent inequitable, uneconomic, and environmentally damaging privatization agreements.

Drivers of Water Privatization

In 1992, the summary report from the water conference in Dublin set forth four “principles,” including the concept that water should be treated “as an economic good” (ICWE 1992). This principle is, without doubt, the most important and controversial of the four. It was sufficiently vague to be accepted by the participants, and yet sufficiently radical to cause serious rethinking of water management, planning, and policy. In the years following Dublin, the concept of water as an economic good has been used to challenge traditional approaches to government provision of basic water services. Economists seized upon the idea to argue that water should be treated as a private good, subject to corporate control, financial rules, markets forces, and competitive pricing.

Various pressures are driving governments to consider and adopt water privatization. These pressures fall loosely into five categories:

- **societal** (the belief that privatization can help satisfy unmet basic water needs)
- **commercial** (the belief that more business is better)
- **financial** (the belief that the private sector can mobilize capital faster and cheaper than the public sector)
- **ideological** (the belief that smaller government is better) and
- **pragmatic** (the belief that competent, efficient water-system operations require private participation) (Neal et al. 1996, Savas 1987).

Privatization efforts in the United Kingdom and Europe were ideologically driven at first, but are increasingly characterized as commercial and pragmatic (Beecher 1997). Privatization efforts in the United States were initially pragmatic, but are now strongly ideological, as can be seen by the public policy push being given to water privatization by libertarian and free-market policy institutes. Privatization efforts in the developing world can primarily be described as financial and pragmatic, though some argue that the social benefits are significant (GWP 2000).

Interestingly, several countries with strong ideological foundations have also chosen to explore water privatization for pragmatic reasons. China and Cuba, for example, have

both recently awarded contracts to private companies to develop and operate municipal water-supply systems and build wastewater treatment plants.

The provision of water to individuals, families, and communities has long been considered an essential public good, and hence a core governmental responsibility. In many countries, including the United States, people expect safe drinking water to be distributed to everyone at low or subsidized prices. Yet despite intensive efforts in the 1980s and early 1990s, more than 1.2 billion of the six billion people on the Earth still lack access to clean drinking water. Nearly 2.5 billion do not have adequate sanitation services (WHO 2000). This failure is one factor leading governments, companies, NGOs, and individuals to rethink their attitudes and approaches to water management worldwide. With world population eventually expected to increase to nine billion, or ten billion, or even more, water managers have realized that adequate water services cannot be provided without enormous increases in investment, improvements in the efficiency of water capture, storage, distribution, and use, and greater wastewater reclamation and reuse.

Water is an essential resource for economic development. Up to a point, greater water availability increases labor supply and reliability by reducing water-related diseases, lowers constraints on agricultural and industrial development, and provides direct employment opportunities as well. A recent analysis ranked water treatment as the second most critical infrastructure investment for emerging economies (Tan 2000). Historically, governments have viewed increased water supply – over and above, or even instead of, meeting basic water needs – as a way to strengthen the overall attractiveness of an economy for both private investors and official development assistance. At the same time, private corporations are moving to ensure adequate water supplies for industrial development when governments cannot, or do not, address corporate concerns. Recent research indicates that increased economic growth need not always require increased water development, but the trend toward privatization still reflects this traditional belief (Gleick 2001). Water-supply projects can be extremely capital intensive, though estimates of future needs vary widely. The World Bank estimates that new investment required for water infrastructure over the next decade will exceed \$60 billion per year. In mid-2001, the American Water Works Association released a study suggesting that \$250 billion may be needed over the next 30 years just to upgrade and maintain the existing drinking water system in the United States (AWWA 2001). The Framework for Action that emerged from the Second World Water Forum in The Hague in March 2000 called for an additional \$100 billion annually from private

sources for the next 25 years to meet basic water needs (GWP 2000).

Whatever the actual investment required, emerging economies face significant hurdles finding the capital to expand coverage in rapidly growing urban areas, maintain existing infrastructure, and treat wastewater to even minimal quality standards. One option is for governments to turn to the private sector, with its greater access to private capital (Faulkner 1997). Because of this, private participation in the water sector is growing especially quickly in developing countries.

Governments must, of course, also spend limited public and international financial capital to meet other social needs (Yergin and Stanislaw 1999). By creating water systems that are self-supported through private investment and by implementing water pricing that pays back the investments, developing country governments can significantly reduce their fiscal and balance of payment problems (Shambaugh 1999). It is also difficult for government officials subject to political processes to raise water prices; privatization permits governments to give that problem to private entities.

The perception that companies are more competent and efficient than government also contributes to pressures to privatize water systems. The complexity of large water systems and their poor historical performance have encouraged the belief that the technical and managerial skills needed to improve water supply and management systems are only available, or at least more efficiently applied, through partial or complete privatization of water supply. Many developing country politicians also view introducing competition as desirable (Shambaugh 1999). Initially favorable results from a few privatization actions have supported these beliefs (see Sidebar 8), although experience with government management of water systems in the industrialized countries demonstrates that governments are not necessarily less efficient or competent than business.

History of Privatization

Private involvement in water supply has a long history. Indeed, in some places, private ownership and provision of water was the norm, until governments began to assume these responsibilities. In the United States, municipal services were often provided by private organizations in the early 1800s. Toward the latter half of that century, municipalities started to confront problems with access and service and began a transition toward public control and management. In particular, private companies were failing to provide access to all citizens in an equitable manner. Private water companies provided 94 percent of the U.S. market in the 19th century,

dropping to only 15 percent by 2000 (Beecher et al. 1995). As Blake (1991) points out:

Private companies supplied water to Boston from 1796 to 1848, and to Baltimore from 1807 to 1854. As late as 1860, 79 out of 156 water works in the United States were privately owned. But eventually most cities turned to municipal ownership. The profit motive was ill suited to the business of supplying water to city dwellers. Private companies were reluctant to invest enough capital; they preferred to lay their distributing pipes through the wealthier sections of the city and to hold back from carrying water into the poorer districts. (Blake 1991)

Anderson (1991) notes that the experience in Chicago and other cities in the United States was similar.

Private companies were notorious for choosing a water source that would minimize the initial investment outlay, and for ignoring the concomitant shortcomings in water quantity and quality. Only municipal governments, so the argument goes, had the foresight and the latitude to invest large sums now in order to gain a future payoff in the form of years of excellent water. (Anderson 1991)

Sidebar 8: Privatization in Buenos Aires, Argentina

The 1993 privatization of water supply in Buenos Aires, Argentina led to some rapid improvements in water availability.

The percentage of the population served has increased from 70 percent to 85 percent, an addition of 1.6 million customers, many of who are poor. The privatization reduced water company staff by 50 percent, reduced non-payment of water bills from 20 percent to 2 percent, and resulted in more modern and efficient billing and water-delivery operations.

The contract governing the privatization action requires a 27 percent decrease in water prices over time. It is too soon to know whether privatization will achieve this goal, or eventually result in higher water prices or distributional inequities.

Sources: Trémolet (2001), p.4, Tully (2000), Muller (1999).

In 19th century France, the trend moved in the opposite direction: municipalities that previously had responsibility for providing water services began to contract services to private operators. Over the years, these operators expanded beyond the borders of France and as a result, they now have a dominant position in much of the world in providing private water services.

Major international efforts to privatize water systems and markets are still a relatively recent phenomenon, with major transfers taking place only over the past ten to fifteen years. By the end of 2000, at least 93 countries had partially privatized water or wastewater services (Brubaker 2001), including Argentina, Chile, China, Colombia, the Philippines, South Africa, Australia, the United Kingdom, and Central Europe, but less than ten percent of all water is currently managed by the private sector (LeClerc and Raes 2001).

In South America, public monopolies were the norm until the mid-1990s. As in many other regions, public water systems consistently failed to provide universal coverage, to treat most wastewater, and to find and reduce water losses that can be as high as 50 percent. Because of these failures, governments in South America increasingly seek private sector involvement. In some cases, such as Buenos Aires, governments have sold or leased water facilities, allowing private operators to sell services directly to the public, with government regulation. Mexico City took another approach to privatization, contracting the rights to operate parts of the city water system to multiple operators, with the goal of stimulating competition among them (Waddell nd). By 2000, almost all countries in the region have begun to commit themselves to long-term private concessions. Chile has gone farther than most by combining the granting of concessions with private ownership of water resources.

Major cities in Asia also suffer from inadequate infrastructure, huge water losses, inadequate sewage treatment, and lack of service to large numbers of peri-urban residents. Australia, New Zealand, Malaysia, and the Philippines are all exploring various forms of privatization, and the water and wastewater utilities in almost every major city in Oceania have been taken over by private entities, or have contracted some important services. Recent efforts in Manila and Malaysia have run into political or economic controversy, causing private companies and governments to rethink the design of contracts and the conditions for concessions, but privatization efforts seem to be accelerating. Nations in Europe have also explored a variety of different models recently, and the UK, Germany, France, and Italy all now encourage water privatization. In France and in the UK, the process is far advanced. The British, under Prime Minister Margaret Thatcher, for example, sold state-owned water operations to private investors more than a decade ago. Some

of those newly privatized companies have become multinational players in privatization markets. Service providers in all four countries initially tried to keep prices low, but have recently imposed large price increases in order to upgrade their plants and distribution systems to accepted European standards. These price increases have led to growing consumer distrust, though some argue that governments would have similarly had to raise taxes or increase borrowing to make comparable improvements, or worse, would have failed to make them.

The United States and Canada have moved more slowly toward privatization. The United States has long had a mix of privately owned and publicly regulated water and wastewater utilities, though an estimated 85 percent of residences still receive water from public agencies (see Sidebar 9).

The Players

There are a handful of major international private water companies, but two French multinational corporations dominate the sector: Vivendi SA and Suez Lyonnaise des Eaux (soon to be called Ondeo). These two companies own or have interests in water projects in more than 120 countries and each claims to provide water to around 100 million people (Barlow 1999, FTGWR 2000: Vol. 94, <http://www.suez.fr/metiers/english/index.htm>) (Tables 4 and 5). Vivendi's water activities are, themselves, a small part of the larger company Vivendi Universal, which was created in December 2000 when it merged with the Seagram Company to form a global media and telecommunications company. As an example of the diversity of Vivendi's activities, in spring 2001, Vivendi purchased MP3.com. The total annual revenue from the interlocking subsidiaries of Vivendi in 2000 exceeded \$37 billion, of which more than 25 percent came from the water business (Market Guide 2001).

Table 4: Population Served by Vivendi Water and Wastewater Concessions

Population Supplied in 2000	Population (millions)
France	25.0
Western Europe	18.5
Central and Eastern Europe	6.3
Middle East and Africa	8.5
North America	16.8
Latin America	7.8
Asia	14.6

Source: FTGWR 2000: Vol. 94, p.10.

Suez is active in more than 100 countries and claims to provide 110 million people with water and wastewater services. Of the 30 biggest cities to award contracts between 1995 and 2000, 20 chose Suez, including Manila, Jakarta, Casablanca, Santiago de Chile, and Atlanta. Suez also purchases stakes or full interests in other water companies:

Table 5: Population Served by Suez Lyonnaise des Eaux Water and Wastewater Concessions

Population Supplied in 2000	Population (millions)
Europe and Mediterranean	43
North America	14
South America	25
Asia Pacific	23
Africa	5
Total	110

Source: <http://www.suez.fr/metiers/english/index.htm>

with its \$1 billion purchase of United Water Resources, it became the second largest manager of municipal systems in the United States, just behind American Water Works. Suez also purchased Nalco and Calgon in the United States for \$4.5 billion, making it the biggest provider of water treatment chemicals for both industry and cities. In 2000, Suez reported profits of 1.9 billion euros on sales of 35 billion euros: of this, 9.1 billion euros (or 44 percent) of revenues came from their water businesses (<http://www.finance.suez-lyonnaise.com>).

Other companies also have major water interests, including Thames Water and United Utilities in Great Britain, Bechtel and Enron in the United States, and Aguas de Barcelona in Spain. To add to the complexity, however, many of these companies have interlocking directorates or partial interests in each other. For example, in spring 1999, Vivendi purchased U.S. Filter Corporation. United Utilities of the UK has joint ventures with Bechtel. United Water Resources in the United States is partly owned by Suez Lyonnaise des Eaux.

Sidebar 9: Water Utility Privatization in Atlanta, Georgia

Throughout much of the 1980s and 90s, Atlanta's wastewater system faced growing problems, including aging infrastructure and inadequate wastewater treatment. Federal, state, and private complaints resulted in millions of dollars in fines and a consent decree specifying expensive corrective action (Brubaker 2001). Faced with the need for almost US\$1 billion in capital for urgent improvements, the city government began to explore the possibility of privatization of some aspects of the local water system. The hope in Atlanta was that privatization would dramatically reduce annual operating costs, reduce the likelihood of rate increases, and free up money for new capital improvements.

In late 1998, the city signed a 20-year agreement to contract water services to United Water Services Atlanta (UWSA), a subsidiary of Suez Lyonnaise des Eaux. While the company made a number of innovative concessions, they also benefited from some significant tax breaks offered by the city. UWSA agreed to locate its regional headquarters in Atlanta, committed to hiring 20 percent of its workforce from the area, and offered to provide US\$1 million in annual funding for water research at Clark Atlanta University. The firm is benefiting from tax incentives of as much as \$8,000 per employee (see <http://waterindustry.org/frame-8.htm> "Atlanta Project in Capsule").

The 20-year agreement between the city and UWSA went into effect on January 1, 1999, covering the operations and maintenance of two water-treatment plants serving 1.5 million people, 12 storage tanks, 7 pumping stations, fire hydrants, water mains, billing, collections, and customer service. The contract set UWSA's annual operations and maintenance fee at US\$21.4 million – thus UWSA can count on nearly half a billion dollars in service fees to be paid by the City of Atlanta over the term of the contract. This is substantially less than the city was expected to spend running the system itself over the same period. The city will continue to spend approximately US\$6 million annually on power, insurance, and monitoring the contract agreements. Atlanta retained responsibility for most capital investments. The agreement also stipulated that there would be no layoffs during the life of the contract, but staff reductions due to retirements and voluntary departures substantially reduced employment costs. At the time of turnover, many of the municipal employees objected to the privatization agreement. While it is too soon to know how well the goals of the effort to privatize the city's water system will be, other U.S. municipalities are watching closely (see Waddell and Brubaker 2001 for more details).

Forms of Privatization

Despite the growing debate about privatization, there is considerable misunderstanding and misinformation circulating about what the term itself means. Privatization can take many forms. Only the most absolute form transfers full ownership and operation of water systems to the private sector. Much more common are forms that leave public ownership of water resources unaffected and include transferring some operational responsibilities for water supply or wastewater management from the public to the private sector. Privatization also does not, or should not, absolve public agencies of their responsibility for environmental protection, public health and safety, or monopoly oversight.

There are many different forms of privatization arrangements, agreements, and models. There is also a fundamental difference between public and private ownership of water assets. Private ownership involves transferring assets to a private utility. Public ownership involves keeping the assets in the public domain, but integrating the private sector in various utility operations and activities through contract (Beecher 1997). Public or private-sector employees can perform various functions. As an illustration, Table 6 lists several functions that could be assigned to private or public employees in thousands of combinations ranging from completely public to completely private operations. These different forms have very different implications worthy of careful analysis.

The different functions in Table 6 can be combined, or broken into even more sub-functions (*e.g.*, design of reservoirs versus design of neighborhood-scale distribution piping). The functions can also be performed privately in one geographic area and publicly in another (*e.g.*, northern and southern halves of a metropolitan area). In the remainder of this chapter we describe fully public water systems and compare them to four variations of models of privatization. Figure 5 “locates” these models in comparison with each other and the many forms of privatization not discussed here, using ownership and management of assets as organizing principles.

Fully Public Water Systems

The various private models described below must be contrasted with fully public water systems. Fully public management of water often takes place through national or municipal government agencies, districts, or departments dedicated to providing water services for a designated service

area (in some cases, an entire country). Public managers make decisions, and public funds are used to finance construction, operation, and maintenance of facilities. Funds may be provided from general government revenues, in competition with other government investments or a water agency may be self-supporting via water charges. Governments are responsible for oversight, setting standards, and facilitating public communication and participation. Independent, special-purpose water agencies or districts can

Table 6: Water System Functions That Can be Privatized

1. Capital improvement planning and budgeting (including water conservation and wastewater reclamation issues)
2. Finance of capital improvements
3. Design of capital improvements
4. Construction of capital improvements
5. Operation of facilities
6. Maintenance of facilities
7. Pricing decisions
8. Management of billing and revenue collection
9. Management of payments to employees or contractors
10. Financial and risk management
11. Establishment, monitoring, and enforcement of water quality and other service standards

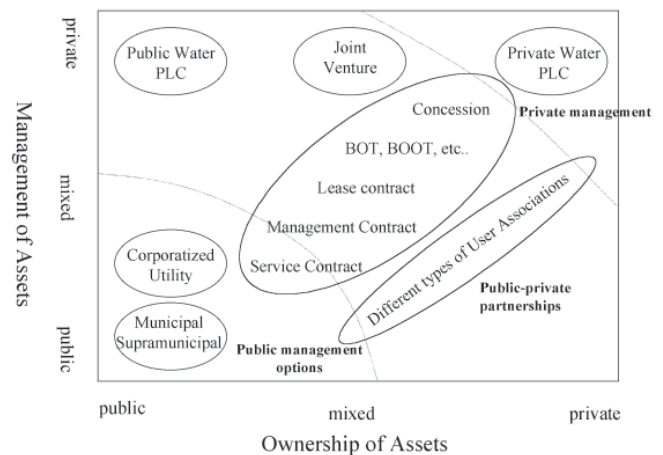


Figure 5: Types of Public and Private Water Providers. Types of public and private water providers characterized by the public and private nature of the assets and management.

Source: Blokland et al. (1999).

have technical and financial capacity equal to private corporations. The poor record of government in many less developed countries has caused this fact to be obscured, and is driving the privatization process more rapidly in developing countries than in, for example, the United States or many European Union countries.

Another form of public management involves cooperatives and user associations in local water-system governance. Typically, local users join together to provide public management or oversight. An example is the public water cooperative in Santa Cruz, Bolivia, which serves nearly one hundred thousand customers. It arose out of a history of central government neglect and, consequently, a strong belief in decentralization. Customers are split into water districts, each covering approximately ten thousand people. All customers have decision-making powers through elections for different water authorities. Elections to six-year terms are staggered, and different authorities are designed to supervise each other. The system is also externally audited each year. Despite the common belief that cooperatives create greater participation by customers, voter turnout has been low. For example, turnout was only 2.5 percent in the June 1998 elections (Nickson 1998).

In 1997, the cooperative compared well to other Bolivian utilities in terms of efficiency, equity, and effectiveness. It received its share of a World Bank loan for all Bolivian water utilities and was quicker to reach the goals funded with the loan. The group incorporates the ideas of a basic water requirement and affordability for the poor through varying rate structures. It also incorporates conservation through increasing block rates, which are not applied to the very poor.

Public Water Corporations and Corporate Utilities

Private-sector participation in public water companies has a long history. In this model, ownership of water systems can be split among private and public shareholders in a corporate utility. Majority ownership, however, is usually maintained within the public sector, while private ownership is often legally restricted, for example, to 20 percent or less of total shares outstanding. Such organizations typically have a corporate structure, a managing director to guide operations, and a Board of Directors with overall responsibility. This model is found in the Netherlands, Poland, Chile, and the Philippines (Blokland et al. 1999).

A main benefit of the system is that it combines two potentially conflicting goals of water supply. Private owners seek to recover costs and maximize profits. Public owners may also seek to recover costs, but they are more likely to

embrace concerns about affordability, water quality, equity of access, and expansion of service.

Empirical evidence suggests such models can attain a high level of operational efficiency and quality of service. Another strength is the stronger potential for public participation and protection of consumer rights. In the Philippines, the Board includes consumer rights associations and in the Netherlands consumer associations publish comparisons among similar companies. This type of customer representation encourages efficiency and discourages political exploitation of the water utility.

Public corporations may have less access to capital, though many have received multilateral development bank funds and the Netherlands system has a strong enough performance record to receive commercial bank loans. The Dutch model also holds the Managing Director personally liable for losses due to mismanagement – increasing the incentive for efficiency, quality, and protection against political intervention.

Service and Leasing Contracts: Mixed Management

In some cases, public water utilities may give private entities responsibility for operation and maintenance activities, general services contracts, or control over management of leased facilities. Ownership continues to reside in public hands. Such models do not usually address financing issues associated with new facilities, or create better access to private capital markets. They do, however, bring in managerial and operational expertise that may not be available locally.

Leasing contracts may include tariff (revenue) collection responsibilities as well as operation and maintenance (Rivera 1996). Such contracts may last for 10 to 15 years or more and arrangements are sometimes made for the private company to share some in the increases in revenues generated from better management and bill collection (Panos 1998). Service contracts range from smaller, one-time arrangements such as meter installation or pipeline construction to longer-term comprehensive arrangements. Areas in which service contracts have proven effective include: maintenance and repair of equipment, water and sewerage networks, and pumping stations; meter installation and maintenance; collection of service payments; and data processing (Yepes 1992).

Concession Models

Much of the debate in recent years over privatization has revolved around more comprehensive concessions to the private sector. This is especially true in Latin America and Asia. The full-concession model transfers operation and management responsibility for the entire water-supply system

along with most of the risk and financing responsibility to the private sector. Specifications for risk allocation and investment requirements are set by contract. To recoup heavy initial investments, concessions are usually long-term, as long as 25 to 50 years. Technical and managerial expertise may be transferred to the local municipality and community over time, as local employees gain experience.

Variations on full concessions include Build-Operate-Transfer (BOT), Build-Operate-Train-Transfer (BOTT), Build-Own-Operate-Transfer (BOOT), Rehabilitate-Operate-Transfer (ROT), and Build-Operate-Own (BOO). These arrangements can be thought of as “partial concessions” that give responsibilities to private companies, but only for a portion of the water-supply system. Ownership of capital facilities may be transferred to the government at the end of the contract. Training of local workers and managers over years prior to the transfer, with their jobs retained from some period after transfer, is a way of transferring skills along with the capital asset.

For both full and partial concessions, governments and companies are finding that responsibilities and risks must be defined in great detail in the concession contract since such contracts are for a lengthy period, and ultimately govern how the concession will perform (Komives 2001). Case-by-case concession contract writing has led to vastly different outcomes for similar physical and cultural settings. The benefits to the public appear to be maximized when the government serves as a skillful contract negotiator.

Fully Private Businesses and Small-Scale Entrepreneurs

The opposite extreme from government agency provision and management of water is supply and management by fully private actors, whether large corporations or small-scale entrepreneurs. In this model, water-quality regulation and other means of protecting “public goods,” such as basic water rights or protection of environmental resources, may be non-existent. Fully private businesses and entrepreneurs are already often found where the existing water utility has low coverage or poor service. They may obtain water directly from a water utility, indirectly from the utility through customers who have utility service, or from private water sources. In some cases, early settlers of an area have privately developed piped water systems, with later settlers becoming customers of, rather than partners in, the piped system. Private providers operate most often in poor urban and peri-urban areas, but they also serve higher income groups or businesses when water is scarce or inconvenient to obtain.

Private suppliers of water also co-exist with public systems when the public system is unreliable, inconvenient, or rationed

(*e.g.*, the utility pressurizes pipes only a few hours each day). In Kathmandu, Nepal, water from privately controlled sources are sold by tanker truck to both low- and high-income areas of the city unserved by regular, reliable supply. Customers may turn to private vendors when they have more money than time for water collection. The public provision of tankered water can also involve high costs and even corruption: in parts of Mexico households dependent on public tankering services must often “tip” providers to ensure service (Muñoz 2001).

Private businesses and small-scale entrepreneurs often operate free of regulation in less developed countries. Private water companies are usually regulated to some extent (*e.g.*, water quality) in more developed countries. Without regulation, high prices or low water quality can cause significant social problems. Numerous studies have shown that the poor often pay much more for water from private suppliers or small-scale vendors than they would pay if a regulated community water system, piped or otherwise, were put into place. For example, in El Alto, Bolivia, where a concession was granted in the mid-1990s, households with private connections spend around \$2.20 per month for 10 cubic meters, while those relying on private vendors pay over \$35.00 for the same amount of water (Komives 2001).

The Risks of Privatization: Can and Will They Be Managed?

The move toward privatization of water services raises many concerns, and in some places, even violent opposition. In large part, opposition arises because of doubts about whether purely private markets can address the many different social good aspects of water, or whether some non-market mechanisms are necessary to serve social objectives.

Other concerns relate to a fundamental distrust of corporate players and worries about the transfer of profits and assets outside of a community or even a country. The greatest need for water services often exists in those countries with the weakest public sectors; yet as we shall see below, the greatest risks of failed privatization also exist where governments are weak.

The rapid pace of privatization in recent years and the inappropriate ways several projects have been implemented have compounded the worries of local communities, non-governmental organizations, and policymakers. As a result, private water companies are increasingly seeing serious and sustained public opposition to privatization proposals. This section describes the major concerns and risks of privatization of water systems.

Privatization Usurps a Basic Responsibility of Governments

Governments have a fundamental duty to see that basic services, such as water, sewerage, and energy, are provided to their people. The failure to satisfy such basic needs, or at least enable the means for them, must be viewed as irresponsible. Efforts of international lending agencies and development organizations have, in the past, focused on helping governments to provide these services. More recently, these organizations have begun to shift their efforts, pushing privatization as a new solution. We have serious concerns about this transfer of responsibility and the loss of control it implies.

Privatization May Bypass Under-Represented and Under-Served Communities

One of the basic goals of any proposal to provide water services (publicly or privately) should be to meet explicitly the needs of under-served communities through an expansion of access to water or wastewater services. Poor peri-urban populations have traditionally been underserved because they lack political power or representation, they come from unofficial “communities,” or they may be unable to pay as much for water as residents in wealthier areas. Privatization can potentially worsen this neglect.

In the past, private companies have been reluctant to make large investments in the water sector in the poorest economies. In some cases, however, reaching underserved populations has been an explicit part of privatization concessions or contracts. The concession granted to serve La Paz-El Alto in Bolivia was designed with performance requirements to expand service to the poor. These “expansion mandates” set obligations to achieve certain levels of coverage and water quality (Komives 2001). The mandates in Bolivia took three forms: connection requirements, coverage targets, and the requirement to connect households meeting specific criteria. The first mandate required Aguas del Illimani (the subsidiary of Lyonnaise des Eaux that won the concession), to install nearly 72,000 new water connections by the end of 2001. The second called for at least 90 percent coverage by 2011. The third required the company to extend services to areas that meet specific population density criteria. One problem with this particular concession is the definition of areas – “area no servida” – that the company has no formal obligation to serve.

Some multinational companies balk at provisions requiring expansion of coverage to marginal communities, stating that it is unrealistic to expect universal household connections in low-income areas in the immediate future, that lack of roads

hinders expansion, and that rapid, uncontrolled peri-urban growth prevents proper water planning and service provision (Shambaugh 1999). When meeting these unmet needs is a top priority for governments, as we believe it should be, tools for inducing concessionaires to invest in coverage in low-income areas should be part of any agreement, with provisions for mandates, quantitative performance indicators, and economic incentives. One benefit of such mandates is that they provide companies with an incentive to develop innovative, lower-cost options for residents. For example, a requirement in Brazil that mandated coverage in certain areas led to the development of condominium sewer systems (see Sidebar 10). Many private companies also request exclusivity over certain service areas, which may help increase the attractiveness of a concession, but exclusivity may suppress competition and the provision of equitable service.

Privatization Can Worsen Economic Inequities and the Affordability of Water

One of the greatest concerns of communities and individuals is that privatization will lead to increases in the cost of water to consumers. Water pricing is a complicated issue – indeed, we note three major different types of pricing and affordability questions associated with privatization:

- Are price increases to consumers necessary?
- Are subsidies appropriate, and if so, what kind and how big?
- How should rates for service be designed?

Are Price Increases Necessary?

The problem of water rates is perhaps the most controversial issue around privatization efforts. One of the leading arguments offered by proponents of privatization is that private management or ownership of water systems can reduce the water prices paid by consumers. Ironically, one of the greatest concerns of local communities is that privatization will lead to *higher* costs for water and water services. The actual record is mixed – both results have occurred. Significant price increases for some groups of water users may also take place even when overall prices do not rise.

Savings from privatization can result from reduction in system inefficiencies, overhead, labor costs, and management expenses. Economies of scale may also exist for developing new infrastructure. Conversely, water supply is a costly business, and substantial improvements in water systems can lead to increased need for revenue from rates. In addition,

the requirement that private companies make a profit may drive up rates in systems where government subsidies were the norm. Private utilities may have better access to capital than some public systems, but they may also have to pay a higher cost for that capital, as well as pay taxes. Finally, a move toward full-cost pricing may improve overall economic efficiency, but contribute to rate increases as subsidies are removed or reduced.

There is abundant evidence that people – even those with low incomes – are willing to pay for water and sanitation when the services are reliable and the cost of delivering services is reasonably transparent and understandable to customers (See Sidebar 11). Experience also suggests that people and businesses will pay more for water without significant resistance when they receive new or improved services that they desire. In the context of privatization, this suggests that dissemination of detailed information about the improvement in services, and the capital investments needed to create those improvements, is essential to public acceptance of increases in overall water prices. The new or improved services should be clearly described and rate changes should be phased in together with strong education and information programs describing the changes and their reason.

Sidebar 10: Condominial Sewers in Brazil

The development of “condominial” sewers in Brazil is an example of a much lower cost method (up to 70 percent reduction in cost) of providing sewage coverage developed when providing coverage in poorer communities is non-negotiable (Wright 1997). Condominial sewers are a particular form of the lateral sewers used to connect homes to main, trunk sewers.

Traditionally, one lateral sewer has been provided for each home. In the condominium scheme, groups of homes share a single lateral sewer that runs from the home furthest away from the trunk sewer to the trunk sewer passing under or alongside homes. The group of homes shares maintenance of the lateral through a users group. The “headaches” of sharing a sewer lateral are considerably less “costly” than the additional capital and maintenance costs incurred if traditional, individual home lateral sewers were provided. More recently, this approach has been applied in Bolivia in the La Paz – El Alto effort.

Problems with setting and defining rates are a leading source of controversy over privatization proposals. When the basic guidelines described here are not followed, rapid and large increases in water rates cause strong social and political reactions. Public protests and political demonstrations over price increases have taken place in such diverse settings as Cochabamba, Bolivia; Tucuman, Argentina; Puerto Rico,

Sidebar 11: Willingness to Pay is Not Absolute: Depends on the Type, Reliability of Water Services

A water supply project in northeast Thailand was intended to provide protected water at the lowest possible cost because people in the area were poor. Because groundwater is abundant in the region, the technology chosen was hand pumps. After about five years most of the hand pumps were not working, and water use habits were largely unchanged. In a follow-up phase, motor pumps provided piped water at community standpipes. Again, the project failed. Five years after implementation 50 percent of the systems were not working at all and another 25 percent operated intermittently.

The failures were attributed to technologies that were too complex to maintain and to the inability of the villagers to pay for improved water supplies. Gradually, however, it became apparent that the main problem was not the capabilities of the villagers but the fact that the service being offered was not what they wanted. They did not want hand pumps, which were not considered an improvement over the traditional rope and bucket system. And standpipes, being no closer than their traditional sources, offered no obvious benefits. Only piped water to yard taps could meet people's aspirations.

In the next project yard taps were allowed, with the users paying the full costs of connection. Five years later the verdict was in: 90 percent of the systems were functioning reliably, 80 percent of the people were served by yard taps; meters had been installed, and locally adapted charging systems had been developed. Not only were the systems well maintained, but because the services was so popular, many systems had extended distribution lines to previously unserved areas.

Source: *The World Development Report*, 1992. Oxford University Press, New York

United States; and Johannesburg, South Africa. In Argentina and Bolivia, rate concerns along with other factors led to privatization efforts being cancelled (see Sidebar 12). Across Southeastern Asia, disputes over water tariffs are raging. In Malaysia, rate increases just prior to privatization led to protests. In Manila, Maynilad Water Services has been lobbying for a rate adjustment to cover losses caused by currency fluctuations, and threatening to return the concession if its petition is refused by the Philippine government (FTGWR 2001: Vol. 117). These experiences fuel public skepticism over arguments that water prices will decline as a result of privatization. In the La Paz/El Alto privatization agreement, the General Manager of Aguas del Illimani mollified the public by stating that he would not raise rates in the first five years of the contract, even if the company's costs rise (Komives 2001).

Are Water Subsidies Appropriate and Desirable?

Subsidies – especially water subsidies – have been a controversial topic for many years (Myers and Kent 2001). On the one hand, economic theory acknowledges that they can be socially desirable and economically efficient in some circumstances. On the other hand, they are often applied as policy favors or social gifts far more widely than necessary to meet critical social goals. Many groups claim they deserve subsidies. Businesses threaten bankruptcy or job cuts if water prices increase. Other users argue that their products or water uses are socially critical or particularly beneficial.

Revenue collected by supplier (rupees per 100 households per month)

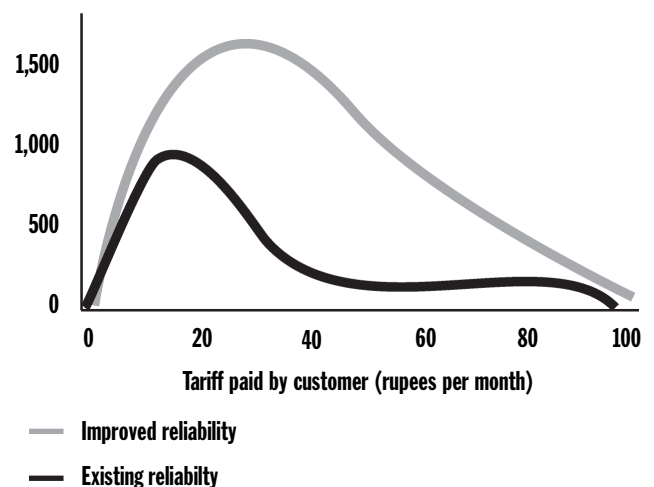


Figure 6: Willingness to Pay, Pakistan. Data from Punjab, Pakistan demonstrates that willingness to pay depends not just on the type of water service, but also on the reliability of that service. As reliability improves, so do acceptable tariffs and revenues to service providers.

Source: World Bank 1992.

Sidebar 12: Failed Privatizations: Tucuman, Argentina and Cochabamba, Bolivia

Aguas del Aconquija, a subsidiary of Vivendi and local Argentinean companies, won a 30-year concession contract in July 1995 to run the water-supply system for the 1.1 million people of Tucuman, Argentina.

Aguas del Aconquija doubled water tariffs within a few months time in order to meet aggressive investment requirements specified in the concession.

A new governor took office around the same time and objected to the privatization. He and his supporters encouraged residents to stop paying bills. Soon afterward, delivered water turned brown, an incident Aguas del Aconquija assured was not harmful and was attributable to the naturally high sediment content of the city's water. The explanation did not convince residents: approximately 80 percent stopped paying their bills.

In October 1998 the concession was terminated, but on the condition that the company continue to operate the water system for 18 months. Vivendi agreed, but quickly filed a US\$100 million suit against the government, and joined several other companies who had filed complaints against Argentina with the World Bank Arbitration Panel.

An outbreak of violence resulting from a proposal to privatize the public water system in Cochabamba, Bolivia's third largest city, exemplifies the severe problems that can result from rushing toward management of water as an economic good while disregarding its social good aspects.

In 1999, the Bolivian government privatized the water system of Cochabamba, partly in response to pressures from the World Bank to make structural adjustments to its economy.

The government granted a 40-year concession to run the water system to a consortium led by Italian-owned International Water Limited and U.S.-based Bechtel Enterprise Holdings. The consortium also included minority investment from Bolivia. The newly privatized water company immediately modified the rate structure, putting in place a tiered rate and rolling in previously accumulated (but not recovered) debt. As a result, many local residents received (or anticipated receiving) increases in their water bills.

Aguas de Tunari maintained that the rate hikes would have a large impact only on industrial customers; however, the poor peasants of the town claimed that some residents saw increases as high as 100 percent. Water collection also required the purchase of permits, which threatened access to water for the poorest citizens.

Local farmers had already expressed concerns about privatization. In October 1998, 3,000 farmers organized a march protesting a draft law to charge for water that they believe they own, and for the lack of government attention to a drought that was ruining farmers and livestock owners.

After the contract was signed, local groups, including rural farmers, community organizers, and even wealthier groups with an interest in maintaining the parallel private water tanker/trucking market held several protests to demand that the water system stay under local public control.

During the protests, the Bolivian army killed as many as nine (reports range from one to nine killed), injured hundreds, and arrested several local leaders. The government also reportedly cut off drinking water to Villa Tunari during this time. Martial law was declared on April 8, 2000 but in late April the government gave in and canceled its contract with Aguas de Tunari.

While the cancellation of the contract and the violence have helped put a spotlight on problems with privatization elsewhere, nearly sixty percent of the population still are not served with any water other than expensive water from private tankers. Moreover, these segments of the population are likely to remain the long-term losers from the continued failure to provide adequate clean water.

Sources: Brook Cowen 1999a; Mandell-Campbell 1998; Hudson 1999; Pilling 1996, FTGWR 2000: Vols. 93&94; Goldman Foundation 2001, Business Wire, October 11, 1999, International Press Service, October 9, 1998, Earth Island Journal, September 22, 2000.

Water-pricing systems often already include some subsidies. Government policies often keep water tariffs low to benefit public welfare. “Lifeline” rates for basic water needs are sometimes available for the lowest income groups in a community. Most governments offer substantial subsidies for agricultural water use by farmers and the poorest urban users. A 1997 rate study from the World Bank notes that agricultural water users may pay as little as 20 percent of the total costs of providing irrigation water and may never fully repay capital costs of projects that benefit them (Dinar and Subramanian 1997). When properly designed, subsidies can satisfy social goals without causing serious problems for the overall market (see Sidebar 13).

The results of subsidies, however, have often been unsatisfactory. The quality of water services and coverage are inadequate in many countries. Subsidies directed at the poor often end up benefiting the wealthier populations, while many poor remain unconnected to the system.

One of the potential benefits of privatization is elimination of inappropriate subsidies, a point not lost on those who argue for increased private control. The public sector is often sensitive – some might say too sensitive – to calls for subsidies from various interest groups. Shifting responsibility to the private sector can lead to prices that better reflect costs and allow governments to discontinue subsidies, while letting private providers take most of the heat for price increases. This can be a clear advantage to privatization.

We also note, however, that *lack* of water subsidies in some cases can have disastrous results, especially when combined with pressures to recover costs. In South Africa in 2000, a massive outbreak of cholera occurred in the KwaZulu-Natal region when the local water agencies began requiring repayment of fees for water services. This led some of the poorest communities to abandon clean utility services and switch to free, but contaminated water, from other sources (<http://www.saep.org/forDB/forDBOct00/HEALTHcholeraBEELD001025.htm>).

We believe that there has been inadequate attention given in privatization negotiations and debates to identifying the difference between appropriate and inappropriate subsidies. When water systems or operations are privatized, it may be desirable to protect some groups of citizens or businesses from paying the full cost of service, perhaps permanently. For example, an affordable supply of water sufficient to meet basic needs may be a fundamental human right or may be socially desirable for other reasons, and hence worthy of a subsidy (Gleick 1996, 1999). In such cases, it might be appropriate to promote the use of tradeable water stamps, as has been done in Chile, or to provide direct subsidies to

Sidebar 13: Subsidies: Balancing Social and Market Needs

The traditional approach to subsidizing low-income water users has been to sell a first “block” of water to each user at a subsidized rate.

This approach encourages conservation of water use in excess of the “block quantity,” but ensures the provision of a minimum amount of water for all users. As a practical matter, the first block is usually made available to all water customers, not just those with a demonstrable financial need.

Another way to subsidize low-income water users begins from the common practice of charging water users periodic fixed fees for repayment of fixed costs of the water supply system (*e.g.*, a bi-monthly fee of United States \$8.00).

These costs, such as amortization of investments in reservoirs and pipelines, do not vary with the amount of water purchased. They can be waived (or even made negative) for low-income households without encouraging wasteful use of water.

Wealthier households must pay a higher periodic fee to support this subsidy, but doing so does not distort the incentive for efficient water use. Since the fixed costs of water supply can be quite significant – sometimes more than half the total cost of water supply – this approach has great promise.

In Santiago, Chile, officials have introduced a “water stamps” scheme that covers part of the cost of water purchases for the poorest residents.

As a result, the private firm running the city’s water has a direct incentive to serve the poor. This program is similar to the U.S. food stamps program, a program that has been found to be superior to food price subsidies because it more tightly targets the people it intends to help and it gives companies the incentive to serve the poor.

Sources: World Commission on Water for the 21st Century (2000); The Economist. 2000. Empresa Metropolitana de Obras Sanitarias S.A. 1995.

reduce water prices for some economic classes because of the positive externalities of higher water use. Water-dependent industries that are critical to local employment patterns or long-term economic growth may also be worth subsidizing, either with revenue from other water users or with general tax revenues.

There are more complicated examples of subsidies, such as when companies bid low on contracts or overpay for water concessions in order to get a foothold in a region. In this case, later and higher bids are used to subsidize the development of a regional presence. For example, the French giants Suez Lyonnaise and Vivendi have been accused of overpaying for initial water concessions. After winning the bid for Germany's first privatization, one Vivendi executive stated, "Berlin was a flagship contract – a symbol. We will use that to make progress municipality by municipality" (Gopinath 2000).

Obtaining contracts at loss, with expectation of making a profit later, is dangerous for both the private company and the host community. An example of the danger to the private company is provided in Sidebar 14. The dangers to the host community are numerous, all related to pressure by the company to increase prices and make a formerly unprofitable contract profitable. Even when prices are controlled by the local community or specified in the privatization contract, companies have claimed that changed conditions render agreed-upon prices inadequate, leading to litigation, reduction in services, or bankruptcy.

The competitive efforts of international companies trying to get a foot in the door or establish a dominant international position have driven immediate profit margins down in many developing country privatization proposals.¹ Some recent requests for proposals explicitly announce that the contract will be awarded to the bid offering the lowest water rate. Although this type of competition, and legitimately improved management in some cases, have led to lower water prices following some privatization actions, such as in Buenos Aires and Manila, it is reasonable to wonder whether privatization will provide water services that are affordable and fairly priced in the long run. Indeed, in Manila, serious problems are now surfacing for both of the water concessionaires and residents due to unexpected currency fluctuations, problems with non-revenue customers, and the size of the debt burden (FTGWR 2001: Vol. 114). As a result, one of the concessionaires, Maynilad, currently loses two pesos for every peso billed – an unsustainable economic situation.

Sidebar 14: The Risk of Accruing Present Losses in the Hope of Future Profits

Positioning a company for future markets while keeping it afloat in the present is a difficult balance. While some analyses suggest that privatization can lead to significant savings, other suspect that low bids for projects represent an effort to get control of a market in the hope of larger returns later. A representative of one large water company was quoted as saying that most of the dramatic savings claimed by private water companies represent losses for the bidders. In Atlanta, for example, he commented, "It all boils down to who wanted to lose the most money for the longest time" (Brubaker 2001).

To the extent that firms so highly value an opportunity to establish themselves that they are willing to underbid their competitors at a loss to themselves, savings will be more modest in the future. Enron Corporation's water utility spin-off, Azurix, planned to become the next Suez or Vivendi in international markets. Azurix seemed ready to expand rapidly. International markets opened more slowly than expected, they failed to obtain several important contracts, and several that they did obtain proved to be uneconomic.

In June 1999, Azurix paid \$440 million for 90 percent of the concession company serving two of the three regions of Buenos Aires, Argentina. It subsequently invested an additional \$94 million. Some analysts have argued that the price paid was excessive (FTGWR 114, p.8), and in January 2001 Azurix took a one-time charge of \$470 million in an acknowledgement that the contract had serious problems. In particular, Azurix concluded that the terms of the contract prevented them from adequately raising capital or receiving an appropriate return on investment.

In the quarter ending September 30, 1999, Azurix brought in a net income of \$18.8 million on revenues of \$170.5 million. One year later, they were carrying a \$3.6-million loss on revenues of \$ 183.7 million. The share price of Azurix – one measure of confidence that revenues and return on investment would be attractive – fell from \$19 per share at the time of the company went public to under \$4 per share. In 2001, Enron took Azurix private again (Rossa 2001).

¹ The potential for sustained competition remains subdued by the strength of France's Suez Lyonnaise des Eaux and Vivendi, water and sanitation's global powerhouses. Other international competitors have yet to match their credentials, experience, financial clout, and political savvy.

How Should Rates Be Designed?

Public acceptance of efforts to privatize water services often hinges on decisions about the design and size of rates. One of the problems with privatization is that the incentives for companies to put in place innovative rate structures often conflict with the incentives for companies to generate revenues. When income is a function of how much water a company sells, rate structures that encourage efficient use and conservation may simply reduce overall income. Similarly, inequitable rate structures that favor one class of user over another may be economically beneficial to a company, but socially undesirable.

Rates depend on a wide range of factors, including the balance between one-time system connection fees, fixed fees, and volumetric water prices. Water can be expensive on a volumetric basis, but affordable for low-income families if connection charges and periodic fixed fees are set at zero for these families. Conservation-oriented rate structures, however, are still not well understood or consistently applied even in more developed parts of the world. For example, in a recent survey of California water utilities, more than half of all rate structures used either flat or declining block rates, which are usually less effective at encouraging efficient use of water than increasing block rates (Black and Veatch 2001) (see Figure 7).

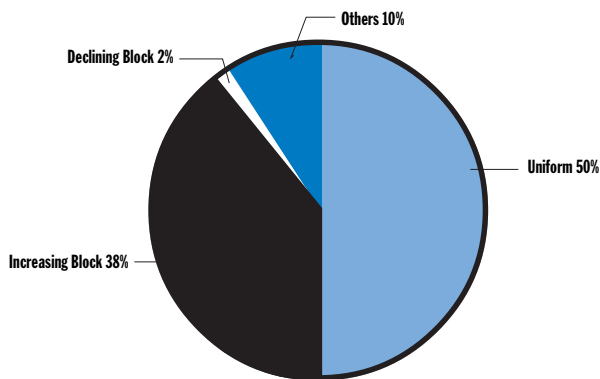


Figure 7: California Rate Structures. Only 38 percent of water utilities in California reported increasing block rates in 2000.

Source: Black and Veatch 2001.

In the La Paz/El Alto concession, a progressive rate structure was developed that subsidized low-volume residential users and imposed an increasing four-block rate – the more water used, the higher the tariff. Industrial customers pay a single rate, equal to the long-run marginal cost. Two tiers were set for commercial users (see Table 7).

Significant customer concerns about changes in water prices are to be expected. As a result, transparent and reasonable

explanations for proposed changes are essential for public acceptance. When subsidies from general tax revenues are eliminated, causing rates to increase in general and rate structures to be changed, detailed information about the alternative use of general tax revenues may also be essential to public acceptance.

Table 7: Tariff Structure for Aguas del Illimani, Bolivia

Tariff (US\$/m ³)	Residential	Commercial	Industrial
0.2214	1 to 30 m ³		
0.4428	31 to 150 m ³		
0.6642	151 to 300 m ³	1 to 20 m ³	
1.1862	Above 300 m ³	Above 20 m ³	All water

Notes:

1. 99 percent of all residential customers use less than 150 m³ per month.
2. The long-run marginal cost is estimated at \$1.18 per m³.

Source: Komives (2001).

Privatization efforts have also been opposed when rate changes have occurred rapidly and without public education. Rapid rate increases, for any reason, tend to engender opposition and protests, even in publicly operated water systems. Phasing in such increases allows people and businesses to adjust to price changes if the schedule of change is communicated in advance and people believe that it will actually be implemented. In many instances, measures to reduce water use can be adopted before price changes take place, which reduces the financial burden of the changes to consumers. This adjustment effect will yield less revenue than would occur with more rapid rate changes, but revenue “losses” due to phasing should not be seen as losses – they would occur anyway as people and businesses seek to avoid higher water prices. In fact, phased changes in water prices and rates are not only less burdensome for customers, they create greater revenue stability for the water supplier and make financial projections less difficult and burdensome.

Privatization Agreements May Fail to Protect Public Ownership of Water and Water Rights

Privatization of water management can, under some circumstances, lead to the loss of local ownership of water systems, which in turn can lead to neglect of the public interest. Many of the concerns expressed about privatization relate to the control of water rights and changes in water

allocations, rather than explicit financial or economic problems. In part, this is the result of the deep feelings people have for water. It is also the result, however, of serious neglect of these issues by some who promote privatization.

Control of water has enormous implications for any society or culture. Many different forms of water “rights” exist – this is not the place to review them (for more information see Bruns and Meinzen-Dick 2000). But each of these cultural, social, or legal controls has developed over time to

Sidebar 15: Establishing Public Property Rights for *In-situ* Water

The Edwards Aquifer of South Central Texas is the sole source of drinking water for 1.5 million people in parts of eight counties, including all of San Antonio, the ninth largest city in the nation (according to the 2000 U.S. Census — www.census.gov). The aquifer provides 300 million cubic meters of irrigation water annually for about 34,000 hectares of agricultural land. It also supports an extremely diverse wildlife population in surface springs and underground. At least nine endangered species rely on springflows for their survival, baseflow in the Guadalupe and San Antonio rivers depends in part on the aquifer, and its subterranean aquatic ecosystem is believed to be the most diverse in the world.

Historically, Texas law granted complete ownership of groundwater to the landowner above it.² This common law rule was replaced long ago in most other U.S. states. Several serious droughts (1984 and 1996), legal decisions to enforce the Endangered Species Act (between 1990 and 1996), and citizen action that raised public understanding of the importance of the aquifer, led the Texas legislature to gradually impose public control over (and hence partial public ownership of) water in this and other aquifers in Texas. In 1993 the Texas Legislature created an Edwards Aquifer Authority to limit water pumping, penalize violators, issue permits, control the transfer of water rights, and institute water quality programs.

address some aspect of public ownership, control, and participation over water and water policy. Among other things, they may ensure equitable access to water service, minimize impacts on downstream water users, protect water quality, or resolve disputes.

While some privatization contracts and proposals do not lead to any formal change in water rights, a growing number either intentionally or unintentionally change the status quo. Some even explicitly transfer ownership of water resources from public to private entities. For example, the Edwards Aquifer Authority in the central United States has considered selling water rights for either a limited period of time (*e.g.*, one year) or in perpetuity (EAA 2001) (see Sidebar 15). Granting perpetual withdrawal rights would reduce the public’s ability to ensure that the aquifer is managed as a social good.

Despite numerous legal challenges, this and other actions to establish public ownership of underground water in Texas have been upheld. Most strikingly, the Supreme Court of Texas rejected a claim that action creating the Edwards Aquifer Authority deprived landowners of a property right vested to them by the Texas Constitution. Establishment of the Edwards Aquifer Authority is an excellent example of the type of changes in property rights and rules that are necessary if water is to be managed effectively as both a social and an economic good (EAA 2001). However, the existence of such public bodies does not ensure sound water management. The Edwards Aquifer Authority itself has allowed some water rights holders to sell those rights in perpetuity (edwardswater.com), thereby reducing the public’s ability to ensure that future water from the aquifer is managed as a social good. Full implementation of public ownership of water at the source requires that ownership cannot be permanently transferred to private hands.

Changes in access and water rights may also occur without explicit agreement. One of the causes of tensions in Bolivia over the proposal to privatize the water systems in Cochabamba were efforts to restrict unmonitored groundwater pumping by rural water users and to bring them into the private system. While this may make sense from a purely economic and efficiency perspective, it imposed a fundamental change in the historical use rights in the region.

Another challenge associated with privatization is the degree to which the process of privatization leads to the transfer of government or public assets into the hands of those who are friends of government, or already wealthy. When privatization

² Unless the groundwater is flowing in an underground stream or river, in which case the laws governing surface water apply.

results in a redistribution of wealth in an inequitable way, there will be strong pressure to oppose or cancel reforms. Confidence in the fairness of the process, in turn, depends on both the design and the transparency of the rules and legal system (Yergin and Stanislaw 1999).

Privatization Agreements Often Fail to Include Public Participation and Contract Monitoring

Oversight and monitoring of public-private agreements are key public responsibilities. Far more effort has been spent trying to ease financial constraints and government oversight, and to promote private-sector involvement, than to define broad guidelines for public access and oversight, monitor the public interest, and ensure public participation and transparency.

Weaknesses in monitoring progress can lead to ineffective service provision, discriminatory behavior, or violations of water-quality protections. In the late 1980s, Guinea had one of the least developed urban water-supply systems in West Africa. Fewer than 40 percent of urban residents had access to piped water, services were irregular, and water quality was unreliable. In 1989, the government of Guinea entered into a lease arrangement for the capital and sixteen other cities and towns. Considerable improvements have resulted (Brook Cowen 1999b), but problems with weak monitoring and enforcement have led to fewer gains to consumers than expected.

One option is to have regulators set and monitor explicit indicators of service performance – “benchmarking.” Benchmarking can focus attention on service quality and

provide incentives for long-term performance. Performance benchmarking has become standard practice in the water-sector reforms in England and Wales. Ofwat, the public regulator, collects and publishes sets of indicators on an annual basis from water and sewerage companies. These scorecards help pressure the worst providers to improve service and boost the reputations of the best providers (Kingdom and Jagannathan 2001). Figure 8 shows the “scorecard” Ofwat produced in 2000, based on variety of performance criteria, including customer service, water pressure, billing factors, public complaints, supply interruptions, water quality, and more.

In Sao Paulo, Brazil, the introduction of pollution tests and public reporting has led 95 percent of polluting industries to install waste-treatment units to avoid paying fines and seeing their names published. Procuraduria Federal de Proteccion al Ambiente, Mexico’s environmental enforcement agency, will shortly publish information on the environmental performance of industries in an effort to encourage improvements in environmental quality (Kingdom and Jagannathan 2001).

There are many barriers to public reporting, including inadequate data, vested interests that block exposure of poor practices, conflicts of interest among agencies that both provide and regulate services, and costs. Nevertheless, the clear advantage of performance monitoring is a strong argument for more universal programs to collect and disseminate benchmarks as a basic part of privatization efforts. The World Bank recently launched an international water benchmarking network to help provide information and cross-country comparisons (www.worldbank.org/html/fpd/water/topics/bench_network.html), but input from consumer groups, local communities, and others must be sought more actively.

Scorecard for Water and Sewerage Companies in England and Wales
1999-2000 Score

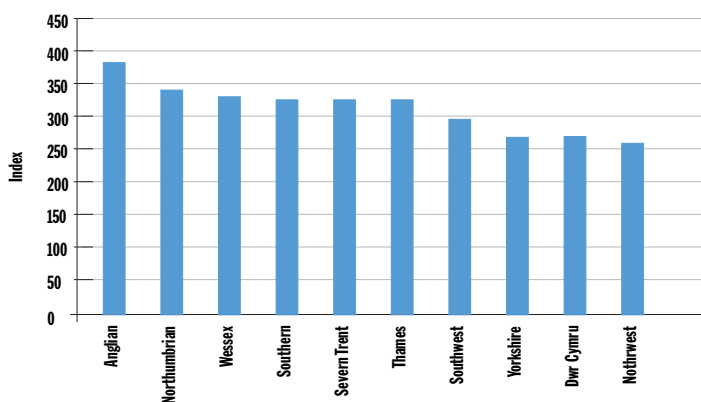


Figure 8: Benchmarking Water Utilities in the United Kingdom. Ofwat is responsible for oversight and monitoring of private water agencies in the United Kingdom. They produce an annual report addressing the performance of water companies. The higher the score, the better the performance. Source: www.ofwat.gov.uk/pdf/files/los2000.pdf

Inappropriate Privatization Efforts Ignore Impacts on Ecosystems or Downstream Water Users

Many privatization contracts include provisions to encourage the development of new water supplies, often over a long time period. If privatization contracts do not also guarantee ecosystem water requirements, development of new supply options will undermine ecosystem health and well-being (for both public and private developments). Famous examples of this problem include the Aral Sea in central Asia and the San Francisco Bay-Delta ecosystem in central California. Similarly, the largest lake in Mexico, Lake Chapala, is shrinking due to overextraction of groundwater, strong expansion of irrigated areas, reduced flows to the Lerma River, and unchecked urban water demand in the watershed. Once *in-situ* flows fall below minimum levels, significant and

costly ecosystem damage occurs or society in general is required to purchase water rights from those who have obtained them for free. Authorities in Mexico are now trying to buy back water from agricultural producers (Muñoz 2001). Decisions about water supply and system operations affect natural flows of water and ecosystem health. Water withdrawals and use come at the expense of riparian and riverine ecosystems. Timing and magnitude of flows may change. Private operators have little incentive to operate reservoirs to maintain minimum downstream flows required for ecosystem health, fishing or recreational interests, and so forth. Balancing ecological needs with water supply, hydroelectric power, and downstream uses of water is a complex task involving many stakeholders. In addition to our growing understanding of the ecological impacts of water development, there has been new attention given in recent years to the economic impacts of these environmental changes as well. We will not review here the growing literature on quantifying the

ecological benefits of water systems in economic terms (see, for example, Postel and Carpenter 1997; Daily 1997), but we point out the growing economic costs – typically billions of dollars – being spent to restore previously degraded systems such as the Everglades in Florida and California’s Sacramento-San Joaquin Delta (see Sidebar 16).

Privatization Efforts May Neglect the Potential for Water-Use Efficiency and Conservation Improvements

Selling water itself is much easier than selling water conservation and efficiency improvements. One of the greatest concerns of privatization watchdogs is that efficiency programs are typically ignored or even cancelled after authority for managing public systems is turned over to private entities. Improvements in efficiency reduce water sales, and hence may lower revenues. As a result, utilities or companies that provide utility services may have little or no financial incentive to encourage conservation. In addition, conservation is often less capital intensive and therefore creates fewer opportunities for investors. Consequently, it may be neglected in comparison with traditional, centralized water-supply projects such as new reservoirs.

Where water scarcity is an important issue, or when new sources of supply are expensive, water-use efficiency improvements may be particularly cost effective. Many of the benefits of such improvements, however, may not be easily or directly measured, including improvements to ecosystem health, energy savings, and reduction in wastewater treatment costs. Capturing those improvements may also be a challenge, requiring policies ranging from proper rate design and pricing to rebates to education and information transfers. Water prices are important tools to encourage improvements in water conservation and use efficiency.

Privatization Agreements May Lessen Protection of Water Quality

Private suppliers of water have few economic incentives to address long-term (chronic) health problems associated with low levels of some pollutants. In addition, private water suppliers have an incentive to understate or misrepresent to customers the size and potential impacts of problems that do occur. As a result, there is widespread agreement that maintaining strong regulatory oversight is a necessary component of protecting water quality. Concerns about the ability of private water providers to protect water quality led

Sidebar 16: The Cost of Failure to Define Minimum In-Stream Flows

Purchase or lease of existing water rights has been used to increase *in-situ* water resources (*e.g.*, water in a river), and is likely to be used much more extensively in the future.

For example, the California-Federal analysis of water-management options (CALFED 1999) that would, in part, increase “environmental flows” through the San Francisco Bay-Delta ecosystem considers payments to farmers to fallow their farmland during dry years. They suggest that \$142-284 million per year would be sufficient to fallow enough farmland to achieve a legally mandated target of an additional 710,000 acre-feet (af) of instream flow. This is a modest amount given the ecological benefits expected. The market tool of paying farmers to fallow land during a drought can be an effective way to improve management of water as an economic good.

The direction of payment, however, suggests that the public in general must dig into their pockets to pay owners of water rights that their government representatives gave away for free in the first place. The historic neglect of instream flows and other environmentally valuable uses of water have created a situation in which the public may have to pay again to restore a public good already lost to them.

the National Council of Women of Canada, a non-partisan federation of organizations, to adopt a policy in 1997 of opposition to the privatization of water purification and distribution systems (NCWC 1997). The Water Environment Federation in the United States supports “national policy to encourage public/private partnerships (privatization)” but with appropriate public oversight (WEF 2000).

When strong regulatory oversight exists, privatization can lead to improvements in water quality. For example, Standard and Poor’s notes that water and wastewater quality have improved in the UK after water privatization (S&P 2000). Indeed, prior to privatization, there was a distinct reluctance of government agencies to monitor and fine other government water providers who were violating water quality standards – a classic conflict of interest. Governments that own, operate, and finance water and wastewater utilities have shown that they cannot always properly regulate them, too. Privatization has the potential to reduce those conflicts and permit governments to regulate. In the UK, government regulators have greatly increased their successful prosecutions for violations (Orwin 1999).

In Buenos Aires, privatization in the early 1990s led to rapid improvements in wastewater treatment. Aguas Argentinas increased the capacity of water-treatment plants and brought on-line wastewater plants that were previously inoperable (Idelovich and Ringskog 1995). In Chile, municipal water companies have been run by concessions for many years, with different regional companies granting concessions for water supply and treatment, water distribution, operation of sewers, and sewage treatment. Starting in 1997, the Chilean government began to privatize wastewater treatment as well. All operators are kept under close scrutiny by the Superintendencia de Servicios Sanitarios, an autonomous government agency (Orwin 1999).

Privatization Agreements Often Lack Dispute-Resolution Procedures

Public water companies are usually subject to political dispute-resolution processes involving local stakeholders. Privatized water systems are subject to legal processes that involve non-local stakeholders and perhaps non-local levels of the legal system. This change in *who* resolves disputes, and the rules for dispute resolution, is accompanied by increased potential for political conflicts over privatization agreements. Public-private partnerships have not often developed clear mechanisms for open participation in dispute resolution, and contracts are often ambiguous in this area. Carefully worded contracts can avoid some such problems. But

the water market is relatively new, and some problems are likely to occur even with carefully developed contract language.

It is becoming clear that governments in developing countries are not experienced in negotiating often very complex contracts that specify level and quality of service, monitoring and success indicators, water quality protection, and so forth, in the midst of difficult-to-estimate growth in demand for water. Contracts also have cultural contexts that differ widely and should be accounted for in specific contract language, such as that related to dispute resolution (Calaguas 1999).

Some have called for voluntary “codes of conduct” by which companies would acknowledge their social responsibilities in providing access to water services. Most recently, the ISO has been presented with a proposal for a set of standards that would apply to all privatization agreements. While we strongly support the concept of standards, benchmarks, and clear contract agreements, such standards must be negotiated in an open, transparent process, with input from all parties, not just water companies.

Privatization of Water Systems May be Irreversible

When governments transfer control over their water system to private companies, the loss of internal skills and expertise may be irreversible, or nearly so. Many contracts are long term – for as much as 10 to 20 years. Management expertise, engineering knowledge, and other assets in the public domain may be lost for good. Indeed, while there is growing experience with the transfer of such assets to private hands, there is little or no recent experience with the public sector re-acquiring such assets from the private sector.

Privatization May Lead to the Transfer of Assets Out of Local Communities

In the past, revenues generated from local sales of water and services went to local agencies for reinvestment in the community. Because of the multinational character of most water privatization companies, some opponents of privatization fear the loss of a wide range of assets that could be transferred out of local communities. These assets include jobs that may go to outside parties and the profits from operations that go to corporate entities in other countries.

Principles and Standards for Privatization

Despite the vociferous, and often justified, opposition to water privatization, proposals for public-private partnerships in water supply and management are likely to become more numerous in the future.

There are many forms of water privatization, or public-private partnerships, making unilateral support for, or opposition to, privatization illogical. We do not argue here that privatization efforts must stop. We do, however, argue that all privatization agreements should meet certain standards and incorporate specific principles. Consequently, we conclude this section with suggested Principles and Standards for privatization of water-supply systems and infrastructure that are now primarily public in character. We believe that the responsibility for providing water and water services should still rest with local communities and governments, and that efforts should be made to strengthen the ability of governments to meet water needs.

As described above, the potential advantages of privatization are often greatest where governments have been weakest and failed to meet basic water needs. Where strong governments are able to provide water services effectively and equitably, the attractions of privatization decrease substantially. Unfortunately, the greatest risks of privatization are also where governments are weakest, where they are unable to provide the oversight and management functions necessary to protect public interests. This contradiction poses the greatest challenge for those who hope to make privatization work successfully.

1. Continue to Manage Water as a Social Good

1.1 Meet basic human needs for water. All residents in a service area should be guaranteed a basic water quantity under any privatization agreement.

Contract agreements to provide water services in any region must ensure that unmet basic human water needs are met first, before more water is provided to existing customers. Basic water requirements should be clearly defined (Gleick 1996, 1999).

1.2 Meet basic ecosystem needs for water. Natural ecosystems should be guaranteed a basic water requirement under any privatization agreement.

Basic water-supply protections for natural ecosystems must be put in place in every region of the world. Such protections should be written into every privatization agreement, enforced by government oversight.

1.3 The basic water requirement for users should be provided at subsidized rates when necessary for reasons of poverty.

Subsidies should not be encouraged blindly, but some subsidies for specific groups of people or industries are occasionally justified. One example is subsidies for meeting basic water requirements when that minimum amount of water cannot be paid for due to poverty.

2. Use Sound Economics in Water Management

2.1 Water and water services should be provided at fair and reasonable rates.

Provision of water and water services should not be free. Appropriate subsidies should be evaluated and discussed in public. Rates should be designed to encourage efficient and effective use of water.

2.2 Whenever possible, link proposed rate increases with agreed-upon improvements in service.

Experience has shown that water users are often willing to pay for improvements in service when such improvements are designed with their participation and when improvements are actually delivered.

Even when rate increases are primarily motivated by cost increases, linking the rate increase to improvements in service creates a performance

incentive for the water supplier and increases the value of water and water services to users.

2.3 Subsidies, if necessary, should be economically and socially sound.

Subsidies are not all equal from an economic point of view. For example, subsidies to low-income users that do not reduce the price of water are more appropriate than those that do because lower water prices encourage inefficient water use. Similarly, mechanisms should be instituted to regularly review and eliminate subsidies that no longer serve an appropriate social purpose.

2.4 Private companies should be required to demonstrate that new water-supply projects are less expensive than projects to improve water conservation and water-use efficiency before they are permitted to invest and raise water rates to repay the investment.

Privatization agreements should not permit new supply projects unless such projects can be proven to be less costly than improving the efficiency of existing water distribution and use. When considered seriously, water-efficiency investments can earn an equal or higher rate of return to that earned by new water-supply investments. Rate structures should permit companies to earn a return on efficiency and conservation investments.

3. Maintain Strong Government Regulation and Oversight

3.1 Governments should retain or establish public ownership or control of water sources.

The “social good” dimensions of water cannot be fully protected if ownership of water sources is entirely private. Permanent and unequivocal public ownership of water sources gives the public the strongest single point of leverage in ensuring that an acceptable balance between social and economic concerns is achieved.

3.2 Public agencies and water-service providers should monitor water quality. Governments should define and enforce water-quality laws.

Water suppliers cannot effectively regulate water quality. Although this point has been recognized in many privatization decisions, government water-quality regulators are often under-informed and under-funded, leaving public decisions about water quality in private hands. Governments should define and enforce laws and regulations. Government agencies or independent watchdogs should monitor, and publish information on, water quality. Where governments are weak, formal and explicit mechanisms to protect water quality must be even stronger.

3.3 Contracts that lay out the responsibilities of each partner are a prerequisite for the success of any privatization.

Contracts must protect the public interest; this requires provisions ensuring the quality of service and a regulatory regime that is transparent, accessible, and accountable to the public. Good contracts will include explicit performance criteria and standards, with oversight by government regulatory agencies and non-governmental organizations.

3.4 Clear dispute-resolution procedures should be developed prior to privatization.

Dispute resolution procedures should be specified clearly in contracts. It is necessary to develop practical procedures that build upon local institutions and practices, are free of corruption, and difficult to circumvent.

3.5 Independent technical assistance and contract review should be standard.

Weaker governments are most vulnerable to the risk of being forced into accepting weak contracts. Many of the problems associated with privatization have resulted from inadequate contract review or ambiguous contract language. In principle, many of these problems can be avoided by requiring advance independent technical and contract review.

3.6 Negotiations over privatization contracts should be open, transparent, and include all affected stakeholders.

Numerous political and financial problems for water customers and private companies have resulted from arrangements that were perceived as corrupt or not in the best interests of the public. Stakeholder participation is widely recognized as the best way of avoiding these problems. Broad participation by affected parties ensures that diverse values and varying viewpoints are articulated and incorporated into the process. It also provides a sense of ownership and stewardship over the process and resulting decisions. We recommend the creation of public advisory committees with broad community representation to advise governments proposing privatization; formal public review of contracts in advance of signing agreements; and public education efforts in advance of any transfer of public responsibilities to private companies. International agency or charitable foundation funding of technical support to these committees should be provided.

Conclusions

As the 21st century unfolds, complex and new ideas will be tested, modified, and put in place to oversee the world's growing economic, cultural, and political connections. One of the most powerful and controversial will be new ways of managing the global economy. Even in the first years of the new century, political conflict over the new economy has been front and center in the world's attention.

We strongly recommend that any efforts to privatize or commodify water be accompanied by formal guarantees to respect certain principles and support specific social objectives.

This controversy even extends to how fresh water is to be obtained, managed, and provided to the world's people. In the water community, the concept of water as an "economic good" has become the focal point of contention. In the last decade, the idea that fresh water should be increasingly subject to the rules and power of markets, prices, and international trading regimes has been put into practice in dozens of ways, in hundreds of places, affecting millions of people. Prices have been set for water previously provided for free. Private corporations are taking control of the management, operation, and sometimes even the ownership of previously public water systems. Sales of bottled water are booming. Proposals have been floated to transfer large quantities of fresh water across international borders, and even across oceans.

These ideas and trends have generated enormous controversy. In some places and in some circumstances, treating water as an economic good can offer major advantages in the battle to provide every human with their basic water requirements, while protecting natural ecosystems. Letting private companies take responsibility for managing some aspects of water services has the potential to help millions of poor receive access to basic water services. But in the past decade, the trend toward privatization of water has greatly accelerated, with both successes and spectacular failures. Insufficient effort has been made to understand the risks and limitations of water privatization, and to put in place

guiding principles and standards to govern privatization efforts.

There is little doubt that the headlong rush toward private markets has failed to address some of the most important issues and concerns about water. In particular, water has vital social, cultural, and ecological roles to play that cannot be protected by purely market forces. In addition, certain management goals and social values require direct and strong government support and protection, yet privatization efforts are increasing rapidly in regions where strong governments do not exist. We strongly recommend that any efforts to privatize or commodify water be accompanied by formal guarantees to respect certain principles and support specific social objectives. Among these are the need to provide for basic human and ecosystem water requirements as a top priority, independent monitoring and enforcement of water quality standards, equitable access to water for poor populations, inclusion of all affected parties in decision making, and increased reliance on water-use efficiency and productivity improvements. Openness, transparency, and strong public regulatory oversight are fundamental requirements in any efforts to share the public responsibility for providing clean water to private entities.

Water is both an economic and social good. As a result, unregulated private market forces can never completely and equitably satisfy social objectives. Nonetheless, the driving forces toward, and potential advantages of, globalization and privatization of fresh water supply will continue to play an important role in future water supply and planning. Given the legitimate concerns about the risks of this "new economy of water," efforts to capture the positive characteristics of the private sector must be balanced with efforts to address its flaws, gaps, and omissions.

Water management is far too important for human and ecological well-being to be placed entirely in the private sector. The proper balance requires that new water management policies and mechanisms be developed that make it possible to manage water as both a social and an economic good. Whether that balance will be achieved remains to be seen.

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