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ADDRESSING WATER CHALLENGES IN THE DEVELOPING WORLD:

A FRAMEWORK FOR ACTION

Bureau of Economic Growth, Agriculture, and Trade
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Cover: Collecting water for household use from a river near Lac Aloatra in Madagascar.
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An Annex of the 2008 Report to Congress for the
Senator Paul Simon Water for the Poor Act

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Preface

Global water resources are coming under increasing pressure. Demand is beginning to outpace supply, and supply itself is being impacted in terms of both quantity and quality by a range of factors, including hydrologic variability, climate change, and environmental degradation. For poor and marginalized populations, who often live on marginalized lands, reliable access to water is tenuous and ensuring adequate water quality is becoming increasingly difficult. As water resources become scarce and as pressures on these resources increase, tensions are likely to grow.

The U.S. Government brings extensive domestic and international experience, resources, and a willingness to enter into diverse and innovative partnerships to address this water crisis. This Framework is the expression of the overall U.S. Government approach to the world's water challenges, embracing the government's broad and interrelated portfolio of water expertise and approaches.

The U.S. Department of State and the U.S. Agency for International Development are committed to investing in the water sector in ways that achieve maximum positive impact through strategic, integrated, catalytic, and innovative action taken in close coordination with host-country partner governments, civil society, and other donors. This Framework lays out guiding principles for U.S. foreign assistance in the water sector. Therefore, this document should be viewed as the overarching strategic structure through which all of the diverse threads of U.S. Government water sector efforts can be woven together.

The 2005 Paul Simon Water for the Poor Act and 2003–2007 congressional appropriations have highlighted the importance of increasing access to affordable and safe drinking water and sanitation within the context of sound water resources management. These priorities and guiding initiatives of Congress are fully embraced within this Framework.

At the same time, these priorities do not define the full scope of needed interventions to ensure that water resources are available to meet the entire range of human development needs, today and into the future. Water supply and sanitation service delivery are intimately connected to the sustainable management of upstream hydrologic resources that, if not appropriately managed, affect the health of humans and ecosystems downstream. The ability of a society to develop is critically dependent on sustainable and sufficient supplies of high-quality water, and the reliable maintenance and sufficient capital investment for water and sanitation infrastructure require healthy economic development.

The Framework also underscores numerous other linkages between water and health, economic growth, humanitarian objectives, democracy, and security goals of the larger U.S. foreign assistance strategy, making a compelling case for supporting a broad-reaching and integrated approach to managing limited water resources. These interventions focus primarily on enabling environments, technology, and human capacity rather than on the construction of large infrastructure and other direct capital improvements.

Introduction

As the first decade of the new millennium comes to an end, there remains no doubt about either the critical importance of water resources to every aspect of life on Earth or the enormity of the water challenges facing human society and increasing human populations. In spite of notable progress, improving water resources management, access to improved water supplies and sanitation, and water productivity remains an immense challenge.

Meeting the growing demands on water resources for people, economies, and nature requires bold action by governments, water users, donors, and the private sector working in partnership to transform water management in fundamental ways. Several international leaders have called for a "blue revolution"—similar to the green revolution—to stimulate concerted action by governments and citizens and avert a looming widespread water crisis emerging in many parts of the globe.

The U.S. Government is committed to using its foreign assistance resources in support of a blue revolution that will help achieve a water-secure world where people and countries have reliable and sustainable access to an acceptable quantity and quality of water to meet human, livelihood, production, and ecosystem needs[1] while reducing the risks associated with hydrologic variability and the projected impacts of climate change.

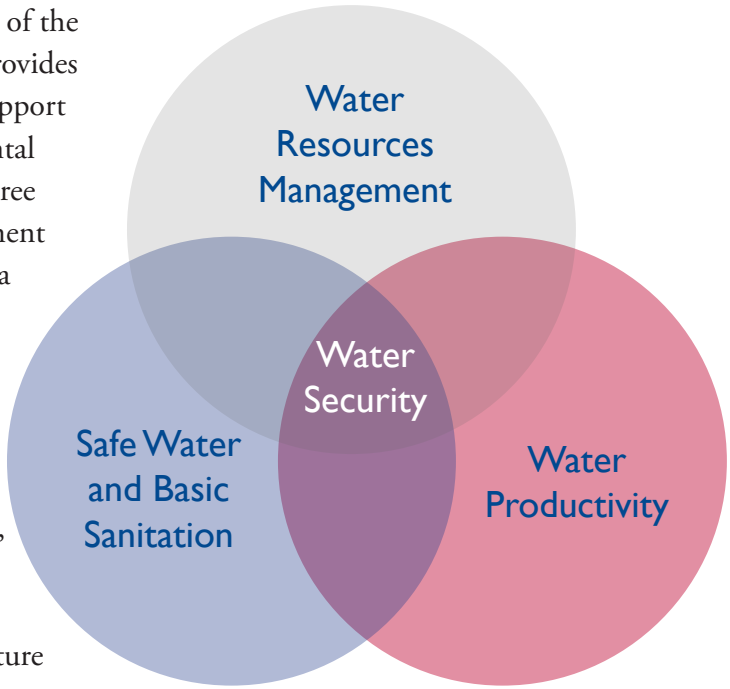
The Global Water Challenge

- More than 2.8 billion people will be living in either water-scarce or water-stressed regions of the world by 2025.
- More than 1 billion people lack access to improved water supply services and more than 2 billion people lack access to improved sanitation, undermining efforts to protect public health.
- Freshwater ecosystems and environmental services from water resources and watersheds are increasingly at risk from human pressures such as water withdrawals, dam diversions, and industrial development.
- Wetland ecosystems, which serve as buffers against natural disasters, are being lost around the world at alarming rates.
- Ninety-five percent of wastewater around the world is discharged into the environment without treatment.
- Nearly 2 million people—the vast majority children under five—die from diarrhea each year, and nearly 90 percent of diarrhea is attributed to unsafe drinking water, inadequate sanitation, and poor hygiene.
- Ninety percent of all disaster-related deaths are water-related.
- More than 260 watersheds, containing more than 40 percent of the world's population, are shared by two or more countries.

1 Adapted from David Grey and Claudia W. Sadoff, 2007. "Sink or Swim? Water Security for Growth and Development." *Water Policy* Vol. 9, No. 6, pp. 545–71.

This Framework for Action outlines many of the key challenges in reaching this goal and provides guidelines for strategic actions that will support individual, organizational, and governmental efforts to achieve a water-secure world. Three interrelated dimensions of water management must be addressed to reach this vision for a water-secure world:

- Improving access to water supply and sanitation, and promoting better hygiene;
- Improving water resources management, including allocation among competing needs; and
- Improving water productivity in agriculture and industry.



Guidelines incorporated in the Framework draw upon the growing body of internationally endorsed principles and good practices. Among these, the U.S. Government understands that water issues are fundamentally interconnected and that specific activities are best developed within the context of the broader water sector.

The following three sections define U.S. Government objectives within each component of the water sector identified above and provide embassies and U.S. Agency for International Development (USAID) missions with guidelines for programming resources and developing activities with their host country counterpart agencies. This document is also intended to inform country-level counterparts and other members of the international water community about the U.S. Government's strategic direction within the water sector to facilitate improved collaboration, communication, and shared learning.

The U.S. Government recognizes that all water issues are ultimately grounded in unique and diverse local political, social, cultural, and ecological contexts, and, therefore, that the portfolio of water sector interventions will be diverse. Guidance, developed for each geographic region, will outline specific goals and priority countries based on regional circumstances and U.S. foreign policy priorities. The elaboration of specific country-level activities will be informed by this regional guidance, in combination with more in-depth analysis and consultation at the local level to determine the most strategic blend of interventions in each place.

Improving Access to Water Supply and Sanitation, and Promoting Better Hygiene

The Scope of the Problem

The health, economic, and social consequences of limited access to clean water and improved sanitation services are enormous, and success in this area is linked to many U.S. Government foreign assistance priorities in tangible and substantive ways. Over the past several years, the international community has agreed to a number of water- and sanitation-related goals, including halving, by 2015, the proportion of people unable to reach or afford safe drinking water and the proportion of people without access to basic sanitation. While, globally, the world is on track to meet the target on drinking water, specific regions lag significantly behind, chiefly Sub-Saharan Africa, and especially in rural areas. Progress on the sanitation goal is much further behind; little progress has been made almost anywhere in the developing world. At current rates of progress, Sub-Saharan Africa will not meet the Millennium Development Goals sanitation target until 2076.

Courtesy of DAI

Children gather water in Afghanistan. Access to clean water poses a daily challenge for families throughout the developing world.

Monitoring Access to Safe Water

Internationally accepted measures of access to safe drinking water do not take into account water quality and reliability. For example, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) estimate that access to piped water in Georgia is 87 percent. However, water quality in many of Georgia's mid-sized cities is so poor that water-borne diseases are often contracted even by those receiving public water supplies. In Armenia, access is estimated by the WHO and UNICEF at 97 percent, but in cities outside the capital, water is usually available less than half of the day, and as little as two to four hours each day in problem areas.

The internationally agreed goals tell only part of the story about water supply and sanitation service delivery. In many parts of the world, populations that have nominally "improved service" suffer problems of both water quality and service reliability. Sanitation is likewise deficient, with shortfalls in both household standards and, where available, service provision. For example,

wastewater service is limited by a focus only on collection of domestic waste, with next to no investment made in treatment of waste before discharge into water courses. The poor suffer disproportionately from low quality of service.

For both water supply and sanitation, a singular focus on the "numbers served" only focuses on immediate service delivery, without attention either to the long-term sustainability of the service or to the deeper, structural changes required to overcome the huge gaps in service coverage that still remain. These problems will only increase in the future—the global population is expected to reach more than 8 billion by 2025, with the major proportion of that growth in developing countries.

The U.S. Strategic Response

A U.S. Government strategic response to addressing the needs for expanding access to improved water supply and sanitation services and promoting better hygiene practices begins with an understanding that the gap in achieving the internationally agreed goals is immense—from the financial, technical capacity, and governance perspectives—and cannot be addressed by any single actor alone. Donor funds combined represent a relatively small proportion of the overall resources and effort needed to meet the internationally agreed goals, improve service quality, and promote better hygiene. The U.S. Government will focus on investments that yield significant long-term impact per dollar spent and create impact at scale. Efforts will be especially centered on tapping into consumers' willingness and ability to pay, wherever possible, in order to increase access, ensure sustainability, and improve the economic feasibility of service delivery.

USAID's comprehensive water supply, sanitation, and hygiene activities will support the three pillars required for sustainable access and use of improved water supplies and sanitation:

- Access to appropriate hardware – municipal and community water supply systems and sewers, household sanitation facilities, and other household-level technologies and products.

USAID's ECO-Asia Program

The ECO-Asia Program demonstrates innovative policies and practices for expanding water and sanitation services to support internationally agreed goals. The four program areas for Asia are: (1) Enabling water services delivery to the urban poor; (2) Demonstrating sustainable sanitation solutions; (3) Improving performance of water services utilities; and (4) Enabling access to finance for water services. Accomplishments include:

Surabaya and Bandung, Indonesia. The program is helping the Surabaya Water Supply Enterprise expand access to safe drinking services for nearly 15,000 low-income households over the next three years.

Negombo, Sri Lanka. The National Water Supply & Drainage Board of Sri Lanka and the Negombo Municipal Council piloted an innovative water distribution system to supply piped water to a poor urban community of 400 residents in Negombo.

Marikina, Philippines. ECO-Asia facilitated a partnership between Manila Water and the city of Marikina to design a city-wide septage management program that will empty more than 92,000 septic tanks in Marikina every five years.

- Behavior change and hygiene promotion – community mobilization for sustained management of water supply and sanitation infrastructure, social marketing of products and behaviors, and school and health clinic hygiene promotion programs.
- Enabling environment – improved policies, institutional support, community organization, finance and cost recovery, and public-private partnerships for improved water supply, sanitation, and hygiene.

Based on experience and best practices, such investments should focus on five programming areas:

- Strengthening the capacity and sustainability of small-scale service providers that operate in rural and peri-urban areas;
- Improving the operating environment, operations and financial sustainability of utilities that serve cities and towns that are undergoing the most rapid population growth;
- Mobilizing capital from domestic markets for infrastructure development on a permanent and sustainable basis;
- Improving household- and community-level hygiene and sanitation; and
- Integrating water supply and sanitation with humanitarian assistance/disaster risk reduction and response programs.

For all aspects of water supply and sanitation access and improved quality of services, there are very different challenges and opportunities presented in the urban, peri-urban, and rural contexts. The U.S. Government strategic approach will customize its interventions accordingly, while also promoting shared learning to adapt/modify successful interventions.

Strengthening the capacity of small-scale service providers. In rural areas or small towns with smaller infrastructure needs, the United States continues to support direct service delivery within a model of ongoing cost recovery and sustainable management at the

USAID's Approach to WASH at Scale in Ethiopia

In Ethiopia, the USAID Hygiene Improvement Project (HIP), together with the World Bank Water and Sanitation Program, is supporting the Government of Ethiopia's efforts to achieve universal sanitation coverage by 2012 in the Amhara region of 20 million. Ethiopia offers key lessons for an integrated scale approach with a national hygiene and sanitation strategy, multisectoral collaboration facilitated by the signing of a memorandum of understanding by three line ministries (health, water, and education), multiple implementation partners, and a comprehensive and strategic approach with training and tools for working in households and communities. A regional water, sanitation, and hygiene (WASH) movement has been created to mobilize stakeholders, build district- and village-level capacity, and support implementation at the district level using a "total sanitation" approach. The program will launch activities in a minimum of 10 districts to achieve "open defecation-free communities." Hygiene and sanitation behavior change is also reinforced using "MIKIKIR," an approach for negotiating improved behaviors that uses existing health extension workers; a school WASH program, building knowledge and practice and encouraging school-to-community action; and a pilot program with President's Emergency Plan for AIDS Relief partners and home-based care organizations helping to develop programming guidance on integrating WASH for people living with HIV/AIDS.

local level. U.S. Government efforts also will test the use of innovative approaches to link small town and village water services into networks that can provide technical and financial support when systems break down and serve as avenues for building the capacity of these small-scale providers to achieve cost recovery and expand services.

Improving operations and financial sustainability of drinking water and sanitation services utilities. In larger towns and cities, it makes strategic sense for the U.S. Government to strengthen the capacity, operations, and financial sustainability of the institutions that provide drinking water and sanitation services. By restructuring operations, instituting operating and financing reforms, building their capacity to operate as independent businesses, improving performance, and implementing full cost recovery, these utilities will be more capable of expanding services to poor slums and peri-urban neighborhoods. U.S. Government efforts will also center on strengthening the operating environment and regulation of these institutions to deliver new access to those who currently are unserved and to improve the quality and reliability of service in targeted locations, particularly those with vulnerable and poor populations.

Courtesy of ARD

A common solution for household sanitation in rural Jamaica – a dry-pit latrine. Latrine pits in this limestone coastline often penetrate fissures, contaminating ground and coastal water.

Mobilizing capital for expanding and rehabilitating infrastructure. Ultimately, achieving the internationally agreed goals requires expanding the pool of capital available to utilities, communities, and households to expand coverage, improve services, and upgrade household sanitation. In conjunction with efforts to improve the creditworthiness of water and sanitation utilities, the U.S. Government is increasingly focused on mobilizing private sector capital from domestic markets for investments in water and sanitation system expansions and upgrades. In many cases, this involves helping governments put in place favorable policies and regulations and establishing financing mechanisms such as pooled financing facilities, revolving funds, and urban infrastructure funds that serve as financial intermediaries for a broader number of creditworthy utilities. Combining these mechanisms with credit enhancements such as USAID's Development Credit Authority (DCA) lowers risks to private sector investors and encourages their investment in the sector. DCA guarantees are also being used to leverage financing through microfinance institutions for small-scale systems and to fund household connection fees and sanitation upgrades.

Improving household- and community-level hygiene and sanitation. To reduce water-related disease and achieve desired health impacts, the U.S. Government strongly endorses that all water supply and sanitation service delivery must be accompanied by strategic investments that promote good hygiene and sanitation practices at the household level that translate into measurable improvements in public health, especially the reduced morbidity and mortality of children under five. These will include investments in ensuring and protecting water quality, hand washing at critical times, and the effective removal and proper treatment/disposal of wastes from the proximity of people's living and working environment.

Integrating sustainable water and sanitation services with humanitarian assistance/disaster risk reduction and response programs. In order to better capitalize on investments in humanitarian assistance for drinking water, basic sanitation, and hygiene promotion, program designs will better integrate disaster risk reduction, disaster response, and development activities to build the capacity of governmental, nongovernmental, and international partners. Specific activities could include establishing financing mechanisms that bridge the short-term humanitarian timeframe with the longer-term development one, designing emergency interventions that provide a foundation for development activities, and integrating risk analysis and risk reduction components into long-term development planning.

Improving Water Resources Management

The Scope of the Problem

Every country and community depends on sustainable fresh water of sufficient quantities and quality to provide for society's needs, sustain economic growth, and maintain ecosystems upon which all life depends. Surface and groundwater resources have come under enormous pressure everywhere from withdrawals, diversions, and pollution. Most countries share water resources with others, further complicating the management of this essential resource. Shared river basins cover 50 percent of the globe, are home to 40 percent of the world's people, and contribute 60 percent of total freshwater flows.[2]

Courtesy of DAI

The Limbe watershed, Haiti. Watersheds serve as the life source for most human development and are some of the final preserves for biodiversity.

Population growth, environmental degradation, hydrological variability, and climate change are stressing water resources and hydrologic systems. Clearing forest lands for agricultural production and mineral and timber resources has degraded many watersheds and impacted downstream ecosystems—including estuarine and coastal ecosystems—through more rapid runoff, increased erosion, reduced groundwater recharge, and greater potential for floods and droughts. Large areas of Africa and Asia experience significant water stress because of extreme hydrologic variability. Climate change may exacerbate these impacts—potentially forcing shifts in human settlements and agricultural practices and dramatic changes in livelihoods. Growing demands for energy and water to meet agricultural, industrial, and urban needs have renewed momentum to develop dams and water diversion infrastructure by both major lending institutions and emerging economies. Unilateral decisions by countries to build new infrastructure may affect shared water resources and undermine the legitimacy of efforts to establish or carry out regional governance of shared river systems.

The challenge facing countries and communities is how to best use their finite but renewable water resources for meeting human, economic, and environmental needs while protecting the quality of this precious resource. Achieving these

2 *Atlas of International Freshwater Agreements,* 2002.

objectives requires governance and management approaches that guide the effective and sustainable use of limited water resources. As competing demands increase, the potential for tensions will heighten, placing current cooperative relationships at risk and raising the possibility of conflicts over water rights, allocations, and use. Avoiding conflicts over water is vital. Conflicts are expensive and disruptive and interfere with efforts to relieve human suffering, reduce environmental degradation, reduce vulnerability to future disasters, and achieve economic growth.

The U.S. Strategic Response

U.S. strategic programming recognizes that shared resources are not just a source of potential tension, but an important opportunity to expand cooperation and transparent and democratic governance models across boundaries. Successes can have a positive influence that extends far beyond water resources management. The U.S. Government has actively supported cooperative and integrated approaches to water resources management around the world, at transboundary, national, and subnational basin scales. It will continue to promote interventions that optimize regional benefits, mitigate water-related disasters, and minimize tensions in shared waters, while also helping to maintain shared ecosystems and improve overall water productivity and security.

Improving water resources management requires satisfying immediate needs while protecting water quality and building the foundation for meeting future demands on water resources. We have learned over the past several decades that investments in policy and legal reforms, building local capacity, and strengthening water resources planning, management, and governance yield more lasting change than investments in infrastructure. By focusing on these types of investments, the U.S. Government can help create and support the underlying conditions for sustained improvements in water resources management.

Most U.S. Government investments will address issues of water quantity and quality through crosscutting programs that focus on other specific development objectives. Within these programs, the U.S. Government will incorporate the principles of integrated water resources management that include:

- Policy, regulatory, and institutional frameworks that address planning and permitting at the appropriate scale and across all relevant sectors;
- Supply optimization, including assessments of surface and groundwater supplies, water balance, wastewater reuse, and environmental impacts;
- Demand management, including cost-recovery policies, water use efficiency technologies, and decentralized water resource management authority;

Courtesy of ARD

Washing near Menongue, Angola, in the Cuebe River, in the upper Okavango River Basin. Rivers and other water sources are under increasing pressure to meet household, agricultural, and industrial development demands.

- Equitable access to water resources through participatory and transparent governance;
- Financing to sustain investments in water resources management and protection; and
- Attention to hydrologic variability and climate change and actions to mitigate and minimize impacts of droughts and floods.

Effective water resources management at the appropriate scale and across all sectors. The U.S. Government will make strategic investments in basin-scale or watershed-scale management, especially in locations where such activities support other foreign assistance priorities. The U.S. Government will also pursue opportunities to engage in national water resources planning and policy setting in targeted countries of strategic importance. Technical approaches will draw upon sound information and science and use spatial planning tools and participatory approaches to improve the capacities of national and local governments to monitor water resources, assess watershed threats, and support integrated management to address sources of degradation, surface and subsurface flows, and community and environmental impacts. By promoting the adoption of best practices by all water users, the U.S. Government can help ensure that hydrologic systems as a whole are managed in a sustainable fashion.

Supply optimization. Most countries face either current or future constraints on water resource availability. Constraints stem from either the physical scarcity of water or the lack of financial resources to meet capital improvement needs, known as "economic scarcity" of water. An integrated water resource management process facilitates stakeholder dialogue on a set of objectives

Courtesy of DAI

A Zimbabwean small-scale farmer. Most food produced in developing countries is by small-scale farmers. Improving water use efficiency and increasing food production by these farmers pose significant challenges.

for water resource development that is compatible with and supportive of the country's broader, long-term development goals, including social, economic, and environmental goals. Moreover, water and energy linkages are an important part of that dialogue. With growing energy costs, it is crucial that water and energy investments be assessed in tandem and consideration given to the impacts that pricing, subsidies, and other factors of one sector can have on the other. The U.S. Government will assist those countries and communities wishing to optimize their water investments while ensuring that efforts to balance supply and demand are based on science and agreed-upon goals across all sectors.

Demand management. It is often more cost-efficient to balance supply and demand by reducing society's overall demand for or use of water. This can be accomplished in many ways, but most notably by eliminating leakages or other loss (non-revenue water) or by increasing

USAID Mission in Indonesia: Environmental Services Program

The USAID/Indonesia Environmental Services Program (ESP) covers six of the most densely populated provinces in Indonesia. ESP is a $47 million program that works with water as an integrating theme to address the linkages among environmental health, water resource protection, biodiversity conservation, and critical land rehabilitation. Public health issues of diarrhea prevention and increased access to clean water and sanitation services are key focal areas.

ESP's work is making a difference. In three years:

- 26 local policies supporting land tenure and community access rights passed;
- 13,092 hectares of critical land were rehabilitated;
- 64,261 hectares of high conservation value forest are under local management;
- 152 community groups practice improved natural resources management;
- 61,479 households, or 249,660 individuals, have increased access to clean water;
- 25,231 people have been trained in effective hand washing with soap;
- $15,318,000 of financial resources have been leveraged to expand and sustain ESP's work;
- 25 water companies have improved operations and efficiency indicators; and
- Indonesian cities finally take wastewater collection and treatment seriously and budget for improved infrastructure.

the efficiency with which water is used in production, especially in agriculture and industry. Demand can be further reduced through conservation, pricing structures, and other water-saving practices and technologies. With the potential of greater water stress and scarcity as a result of climate variability, these and other measures, such as drought contingency plans, will play an important role in a country's overall water strategy. The U.S. Government will continue to promote measures to reduce water demand as an alternative to costly and not always appropriate efforts to augment supply.

Addressing water quantity and quality challenges. While some U.S. Government programs will explicitly focus on addressing water quantity and quality challenges, this approach also recognizes that water is a "means" to numerous development "ends," and embraces programming that draws upon the best practices of integrated water management to address both water quality and quantity challenges within the context of other development assistance objectives (see textbox). In some countries, U.S. Government programming will support one aspect of water resources management in close coordination with other actors, making complementary investments that seek to address gaps and collectively achieve a more holistic approach.

Equitable access through participatory and transparent governance. There is a growing awareness by governments around the world that water management must be better integrated geographically and across sectors. However, water governance in most countries is very fragmented and rarely involves stakeholders fairly and democratically in making decisions about

how much water goes where, to whom, and for what purpose. While experts and organizations encourage integration and governance around hydrologic boundaries such as river basins and aquifers, political and operational realities argue for flexible governance arrangements based on participatory and democratic governance models at a variety of scales. The U.S. Government will emphasize improving governance and building capacity to support long-term improvements in water management. U.S. Government interventions could focus on building trust and facilitating dialogue, improving the information foundation for management decision making, and strengthening institutional and organizational capacity to effectively engage in cooperative management of water resources. Building transparent, effective, and equitable governance systems will help balance tradeoffs in the allocation and use of water, ensuring that human, economic, and environmental needs will be met in the most optimal manner possible.

Mobilization of financing. Lessons from the past 25 years highlight the critical need for financing to sustain improvements and investments in water resources management. With the exception of a few countries where infrastructure links to broader foreign policy objectives, such as Iraq, Afghanistan, and Sudan, the U.S. Government does not invest directly in large water infrastructure projects. The U.S. Government supports efforts to develop and test innovative financing mechanisms such as payments for environmental services and carbon credits that can generate sustained flows of financing to support continued and expanded efforts to improve land and water resources management.

Courtesy of DAI

The aftermath of the 2004 tsunami, Aceh, Indonesia. Severe storms and flooding can contaminate surface and groundwater supplies used by households, farms, and businesses.

Managing hydrologic variability and adapting to climate change. Hydrologic variability and climate change pose serious threats to many regions of the world. The U.S. Government can help countries to reduce vulnerability to droughts and floods by implementing disaster risk reduction activities, including integrated water resources management. The U.S. Government can also develop country capacity to monitor and assess the impacts of hydrologic variability and climate change on economic and human development, increase resilience through disaster preparedness and mitigation, and prioritize investments and actions to increase resilience to climate variability and change.

Improving Water Productivity

The Scope of the Problem

Water is literally the lifeblood of human productive activity. Today, the competition for scarce water resources in many places is intense. Many river basins currently have insufficient water to meet all the demands—or even for their rivers to reach the sea and nourish critical fish nurseries, an important source of food protein. The critical importance of improving water productivity for essential economic development and ecosystem services will only increase in the coming decades as the world's population grows and economies industrialize. The world's population faces two great challenges with respect to water—improving the efficiency of water use in agricultural and industrial production and in growing urban centers, and protecting and maintaining water quality.

Courtesy of DAI

Water user association members checking control gates in an irrigation system in Kyrgyzstan. Water user associations have often proven effective managers of irrigation infrastructure and scarce water resources.

Seventy-five percent of the additional food needed for the next 50 years can be met by bringing the production levels of the world's low-yield farmers up to 80 percent of what high-yield farmers get from comparable land. Better water management plays a key role in bridging this gap.

The great majority of fresh water used by humans is for food production—roughly 70 percent worldwide and 82 percent in developing countries. The current food security crisis underscores, among other challenges, the need to expand production of basic grains. Scientists estimate that the amount of water required to meet global food requirements will almost double by 2050 unless farmers adopt technologies and practices that yield more crop per drop. Many countries already face extreme hydrologic variability. Climate change will exacerbate these challenges and will affect water use in agricultural production as some regions become drier—especially in the subtropics, where most poor countries are situated. For example, the current rapid increase in food prices affecting countries around the world is caused in part by several years of bad weather in Australia, China, and parts of Eastern Europe, which have reduced grain harvests, especially wheat.

The food crisis has many dimensions, however, and it would be short-sighted to focus solely on increased agricultural production. In fact, ecosystem goods and services contribute

Courtesy of DAI

A fish farm in Lake Sebu, Philippines. Fish farming offers one way to meet growing demand for food. However, it also can lead to the eutrophication of lakes and bays.

immensely—both directly and indirectly—to global food security, and water resources play a central role in keeping these healthy. More than 1 billion people in the developing world, for example, rely on fish as their principal source of animal protein. Abundant supply of good-quality fresh water is of course essential to inland freshwater fisheries, but the same is true for as much as 75 percent of commercially important marine fisheries. This is because these species are dependent, for at least part of their lifecycles, on estuaries, and nothing is more fundamental to the health of an estuary than the inflow of fresh water. Clearly, water resource planners and those responsible for global food security must work together closely to ensure understanding of a common agenda.

Industrial and commercial water consumption is also increasing as economies grow and develop. As river basins come under increasing pressure, the tradeoffs between water allocations for domestic use, agriculture, industry, and ecosystem services will only intensify.

The effects of agriculture, industry, and commerce on water quality are enormous, largely unquantified, and nearly unchecked in most developing countries. Water quality is being degraded rapidly by widespread use of fertilizers and pesticides in agriculture, by industrial effluents, and through the uncontrolled dumping of untreated human wastes in rivers, lakes, and oceans. The effects of uncontrolled water pollution show up in the increasing number of reports of pollution-related health problems, contaminated foods, wildlife morbidity and mortality, and biologically dead and dying rivers, lakes, and ocean areas. All countries face increasing costs and challenges in reducing pollution threats to human health, future livelihoods, and overall ecosystem viability.

The U.S. Strategic Response

The U.S. Government will focus predominantly on approaches that:

- Improve water use efficiency in agriculture;
- Help countries manage hydrologic variability and adapt to climate change;
- Reduce water pollution by industry; and
- Improve water use efficiency in cities.

These are the most cost-effective and efficient ways to intervene and tend to be those that are most sustainable and market-friendly, and for which sound business cases can be made.

Improve water use efficiency in agriculture. Improving water use in agriculture involves addressing issues of water pricing and water rights, while strengthening the role of institutions that enforce water pricing and rights. The U.S. Government will continue supporting efforts to improve agricultural productivity by emphasizing irriga-

tion system efficiency, working with public and private extension services to increase the adoption of improved production technologies and systems and appropriate crops for specific environments by farmers, and, where appropriate, promoting the reuse of treated wastewater for agriculture. With the growing expansion of aquaculture, the U.S. Government can work with research institutions to develop improved aquaculture production technologies and systems that increase yields while reducing water demand and promoting the use of aquaculture species and systems that improve water quality.

Help countries adapt to hydrologic variability and climate change. In countries facing greater risks of drought or long-term drier climates, the U.S. Government will promote adaptation to drier climates by expanding efforts in water harvesting and small-holder water capture and distribution systems. The U.S. Government will build on its experience in designing and financing small and medium-scale water capture and distribution infrastructure to improve water security for rain-fed agriculture.

Reduce water pollution by industry. To reduce water pollution by industry, key areas of engagement include:

- Supporting policy improvements that include "polluter pays" principles, and improving regulations and policies that establish clear and appropriate rules for private sector productive water use;
- Strengthening the role of institutions tasked with enforcing regulations and protecting water quality; and
- Promoting the adoption by industries of cleaner production processes that reduce overall effluents and the treatment of wastes before discharge.

Improve water use efficiency in cities. In growing urban areas, the U.S. Government can help water utilities reduce physical leaks, institute and carry out demand-side management programs, craft regulations and ordinances, and design communications/outreach programs to promote water use efficiency by households and businesses.

The U.S. Government will also promote alliances with key private sector actors in order to couple development objectives with private companies' own commitment to responsible water management. These investments will be done with an eye toward shared private sector financing and piloting lower-cost or innovative technologies.

Water Sector Programming in Country Development Plans

In the end, all of the strategic water intervention areas outlined above must take shape in real places, within the real constraints and opportunities presented in each country. Programming decisions about the proper mix of interventions will take place at the country level as part of regular country-level operational planning. There are critically important water sector needs in virtually every country where the U.S. Government engages in development assistance. Resources are limited, however, and competing development needs are often compelling.

In strategic development programming at the country level, the U.S. Government will seek the right balance that optimizes the impact of water sector investments—especially for underserved and poor populations—while maintaining coherence of the assistance portfolio as a whole. In reaching this balance, the U.S. Government will take into account numerous factors (see textbox). The prior three sections have focused on factors specific to countries and regions. U.S. Government programming decisions also will be influenced by factors external to the country. These are briefly discussed below. In all cases, the "big picture" of U.S. foreign assistance priorities will serve as the starting point.

U.S. Government comparative advantage. With limited resources, missions are encouraged to target areas of U.S. Government comparative strength in water resources programming. For example, USAID has gained considerable experience in technical capacity building, institutional strengthening, legal and policy reform, participatory governance support, financing and resource mobilization, and fostering of innovation in all aspects of water management. Other U.S. agencies, such as the U.S. Environmental Protection Agency, are recognized worldwide for their specialized expertise in wastewater management

Planning Considerations for U.S. Government Water Sector Programming

Country-Specific Planning Factors

- Level and type of need in each water subsector (water supply, sanitation/hygiene, water resources management, water productivity)
- Country enabling environment related to the water sector

External (U.S. Government) Planning Factors

- U.S. Government comparative advantage
- Opportunities to integrate water investments within USAID's overall country portfolio
- Opportunities to build on parallel and complementary activities of other donors and international nongovernmental organizations (NGOs).
- Partnership opportunities (Global Development Alliances and others) with significant matching resources or other value-added contributions
- Consistency with U.S. foreign policy priorities
- Compliance with statutory requirements, directives, and funding accounts

and technologies. Finally, the U.S. Government has demonstrated leadership within the donor community in supporting creative alliances and partnerships that engage private companies, international NGOs, and other donors in achieving common objectives in the water sector.

Opportunities to integrate water investments within USAID's portfolio. The interconnectedness of water throughout all aspects of development is undeniable. The health, economic, and social consequences of water deficits in both quantity and quality for all users and for the environment are enormous and linked to many U.S. foreign assistance priorities in tangible and substantive ways. In fact, every development goal is linked to at least one dimension of water management. While this Framework describes specific approaches within various water subsectors, the U.S. Government will also seek opportunities to achieve water sector objectives throughout the development agenda. Following are just a few examples—both across the four highlighted dimensions of the water sector, and among water and other development sectors.

Courtesy of AED

Children line up to wash hands on Global Hand Washing Day in Madagascar. School-based programs contribute to improved community hygiene behaviors.

Potential linkages within water sector activities:

- *Water supply services and water resources management:* Poor land management and uncontrolled pollution degrade water quality. A more integrated approach to watershed resource management can improve the safety of drinking water supplies and benefit downstream users of water as well as the environment.
- *Sanitation services and water resources management:* Most urban and rural sanitation solutions focus on removing fecal waste from the immediate human environment with little attention to the treatment and safe disposal of these wastes. This often results in severe consequences for communities living downstream who rely on surface water for their water supply. Moreover, insufficient waste treatment can negatively affect economic productivity, biodiversity, and ecosystem services. A more integrated watershed perspective would ensure that waste treatment and disposal are incorporated into ongoing efforts to improve sanitation services and household hygiene practices.
- *Water productivity and water supply services:* The development and maintenance of water supply systems is one of the greatest challenges facing low-income communities. Beyond drinking water, the livelihood of rural residents depends on reliable water sources for sustaining agricultural and livestock production, aquaculture, and enterprise development. Promoting approaches such as multiple use services will simultaneously address the full spectrum of community water supply needs—both potable and productive.

Potential linkages between water activities and other sectors:

- *Water and HIV/AIDS:* Access to water in sufficient quantities and of high quality is essential for mitigating the diarrheal disease that afflicts more than 90 percent of people who live with HIV/AIDS. The U.S. Government has developed a Preventive Care Package for these populations and their families that includes information on safe drinking water, washing hands with soap, and safe disposal of feces. The U.S. Government encourages the incorporation of such activities into all HIV/AIDS programs.
- *Water and governance:* There is a close relationship between water resources management and good governance practices. The sustainability of water resources depends on getting the governance right. Interventions that strengthen the capacity of water authorities and related institutions have positive repercussions, including building the capacity of local governments, strengthening decentralized institutions, and empowering women to take leadership roles in community life.
- *Water and education:* Evidence clearly links school attendance to the availability of water supply and sanitation facilities in school compounds, especially for girls. The presence of adequate sanitation facilities ensures sustained attendance, particularly when girls reach adolescence. School-based water/sanitation/hygiene programs also serve as platforms to improve hygiene behaviors throughout communities as a whole.
- *Water and humanitarian response:* The U.S. Government makes significant investments in water supply and sanitation services in response to humanitarian crises caused by natural and manmade disasters. The incidence of disasters is projected to increase with greater climate change, impacting humans and ecosystems around the world. Sound water resources management, increased cooperation at the basin-scale, and capacity building to support institutions and communities will strengthen self-resiliency and can help break the cycle of chronic vulnerability while laying the foundation for more sustainable development.

Courtesy of DAI

Drip irrigation kits enable Ethiopian families with members suffering from HIV/AIDS to establish gardens that improve household nutrition and provide sources of income.

Leveraging opportunities with other donors. Multilateral donors such as the World Bank (including the Water and Sanitation Program) and the regional development banks and bilateral donors such as Australia, Germany, Japan, Denmark, the Netherlands, the United Kingdom, and Sweden have significant water sector programs. The World Bank's Water and Sanitation Program, in particular, is at the forefront of many efforts to improve access to safe water and basic sanitation in Africa and Asia. Opportunities exist for the

Courtesy of DAI

Rice farmers in Vietnam. Increasing food production depends upon reliable sources of fresh water in addition to improved seed varieties, fertilizers, and farm management technologies.

U.S. Government to leverage its efforts for greater impact by coordinating with ongoing or new programs funded by these donors.

Partnership opportunities. USAID has pioneered alliances and partnerships with private companies, foundations, and international NGOs to solve water supply and sanitation challenges. Using the Global Development Alliance model, these partnerships have helped mobilize significant resources to improve access to safe water and basic sanitation. Examples of these alliances include the Community Water and Sanitation Facility that works in partnership with different organizations in many countries, the West Africa Water Initiative, and the Safe Water Partnership.

Consistency with U.S. foreign policy priorities. U.S. water sector investments are not made in a vacuum, but are always targeted within the context of broader U.S. foreign assistance priorities identified for each country in the areas of economic growth, health, democracy and governance, humanitarian assistance, or peace and security. The United States also supports activities in a broad range of country types, ranging from fragile states to strategic partner countries, so that a "one size fits all" model does not apply. Specific water programming will always be guided by this macro-strategic foreign policy context.

Monitoring and Evaluation

All strategic actors in the international water sector require access to good information for multiple purposes, including strategic planning to prioritize interventions; advocacy to influence decision makers and mobilize resources; programming of specific project activities; accountability to clients/beneficiaries, governments, and/or donors; and advancement of overall water sector learning. Solid and credible metrics and monitoring systems that produce sound information are used to track specific progress of U.S.-funded programs and assess national and international water sector trends.

Courtesy of DAI

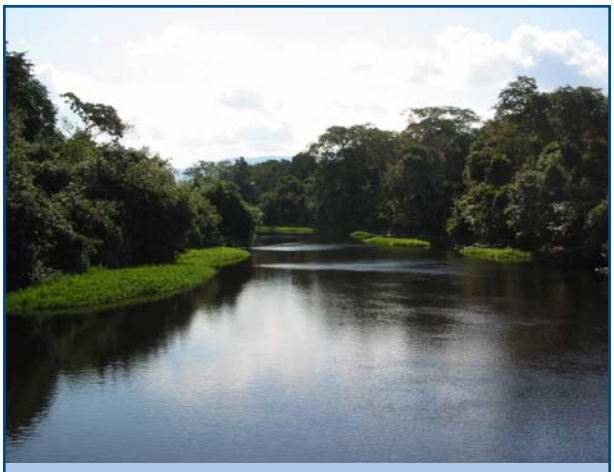
Monitoring water quality in Indonesia. Linking water quality monitoring with public outreach has improved support for investments in wastewater collection and treatment infrastructure.

To track program performance in the water sector against specific program objectives and support for broader worldwide goals, the U.S. Government has developed standardized common indicators and reporting systems that document how resources are being invested and the impact that they have. Moving forward, the U.S. Government will continue to refine and improve these information and reporting systems and provide guidance and training for field staff to improve project and program monitoring and evaluation in a manner consistent with international best practices.

Beyond the domain of U.S.-funded activities, there is recognition of the need to improve information about water resources management, use, and progress toward achieving the internationally agreed goals. As both a producer and consumer of sector-level data and information, the U.S. Government is committed to sharing information and experiences to improve data collection, analysis, and reporting on water sector metrics. The U.S. Government will participate, as appropriate, in international technical efforts to improve global data collection related to water supply, sanitation and hygiene, water resources management, and water productivity. To the extent that the U.S. Government invests in data collection in the water sector, it will work with the international community to enhance the depth and quality of water-related measures included in these efforts.

Conclusion

Water resource problems are mounting and have the potential to constrain human well-being, including that related to economic development, food security, and healthy ecosystems. In many parts of the world today, current practices in the management, or mismanagement, of water resources have led to severe challenges in meeting future human, economic, and environmental water requirements. To achieve water security, individuals and countries must have **reliable** and **sustainable** access to an acceptable quantity and quality of water to meet human, livelihood, ecosystem, and production needs while reducing the risks of extreme hydrological events that can be devastating to people, the environment, and economies. To achieve this goal, USAID and the Department of State will focus their efforts in three areas: (1) increasing access to, and effective use of, safe drinking water and sanitation to improve human health; (2) improving water resources management; and (3) increasing the productivity of water resources. Within each of these areas, U.S. Government investments will support activities and actions that lead to lasting changes in the underlying conditions for sustained improvements in water resources management.



Courtesy of DAI

The Guaporé River, Brazil. Preserving water quality and flows is essential to long-term sustainable development.

The U.S. Government offers its experience and resources in support of efforts by committed countries to help achieve a water-secure world with sustainable quantities and quality of water to meet human domestic use, food production, economic development, and ecosystem needs.

Bureau of Economic Growth, Agriculture, and Trade
U.S. Agency for International Development

Bureau of Oceans, Environment, and Science
U.S. Department of State