USAID
FROM THE AMERICAN PEOPLE

Safeguarding the World's Water

2008 Report on USAID Water Sector Activities

September 2009

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Cover photo: A young boy takes a shower at his home in Negombo, Sri Lanka, where ECO-Asia helped connect a poor urban community to piped water.

Credit: Luke Duggleby/AECOM International Development

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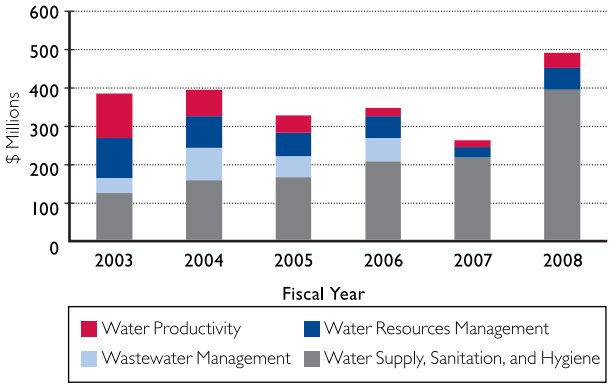
Introduction and Summary

CURT CARNEMARK, 1979

Adults and children at a communal water source in India.

The following report summarizes the fiscal year (FY) 2008 investments and programs of the U.S. Agency for International Development (USAID) in safe drinking water and sanitation supply projects and related water management activities. The funding figures it presents are based upon actual obligations[1] and budget commitments reported by USAID operating units around the world through March/April 2009. The report describes all of USAID's water management programs that help ensure water security and sustainability with equity.[2] These programs address the following specific areas: 1) water supply, sanitation, and hygiene (WSSH); 2) water resources management (WRM); 3) water productivity (WP); and 4) water-related disaster risk reduction (DRR).

Figure 1: USAID Obligations for Water Sector by Theme, FYs 2003–2008 ($ Millions)



The Problem

Water is an essential component of human health, food security, economic growth, national and regional political security, and environmental sustainability. However, more than 1.2 billion people worldwide, and one in every four people in the developing world, currently lack access to an improved water supply; two in every five people have no access to improved sanitation. The reasons for this shortfall are diverse and include competition for and inadequate management of water resources; ineffective institutions and related human resources; shortfalls in financing; and lack of demand, especially for sanitation, particularly in communities where open defecation has been widely practiced for many years. Approximately 450 million people in more than 30 countries face serious shortages of freshwater. By 2025, this number is expected to increase to 2.8 billion people in more than 48 countries; 40 of these countries will be in the Middle East, North Africa, or sub-Saharan Africa. While most water demand is for agricultural production, competition for scarce local and regional water resources will increasingly have an impact on water requirements for domestic purposes. Globally, water demand tripled during the past century alone and is doubling every 20 years – a strong indication that a continued strong commitment to, and substantial investment in, efforts to vigorously address the need for water security and sustainability with equity are required.

FY 2008 Results

During FY 2008, USAID provided either improved water supply or first-time access to improved water supply to more than 7 million people (more than 4 million of whom received first-time access). More than 6 million people received access to improved sanitation, of whom more than 2 million received their first access. The Agency's investments in "safe drinking water and sanitation supply projects, including water management related to safe drinking water and sanitation supply" (the language of the appropriations legislation), reflect the urgent need to provide a safe and affordable domestic water supply that is effectively integrated into overall water resources management.

FY 2008 Budget Obligations

USAID's total FY 2008 investments in all aspects of the water sector (WSSH, WRM, WP, and DRR) reached just under $490 million in 2008. After a decline from 2005 to 2007, this figure represents a recovery to levels far higher than those prevailing during 2003 and 2004 (see figure 1). Regionally, water sector activities in Africa received the most funding ($211.7 milllion, or 43 percent),

[1] This report uses the term "obligations" rather than "expenditures." It is important to note that obligations refer to funds appropriated by Congress and committed by USAID to a specific grant, contract, or other agreement or activity in a particular fiscal year, while expenditures refer to those obligated funds that have actually been spent by the Agency.

[2] "Water security and sustainability with equity" simultaneously considers the need for human access to safe and affordable water for health and well-being; the assurance of economic and political stability; the protection of human populations from the risks of water-related hazards; the equitable and cooperative sharing of water resources; the complete and fair valuation of the resource; and the sustainability of ecosystems at all parts of the hydrologic cycle.

Figure 2: Estimated USAID Water Sector Obligations by Region, Including Int'l. Disaster Assistance and Food for Peace, FY 2008 Worldwide Funding ($ Millions)

Total $489.6 Million

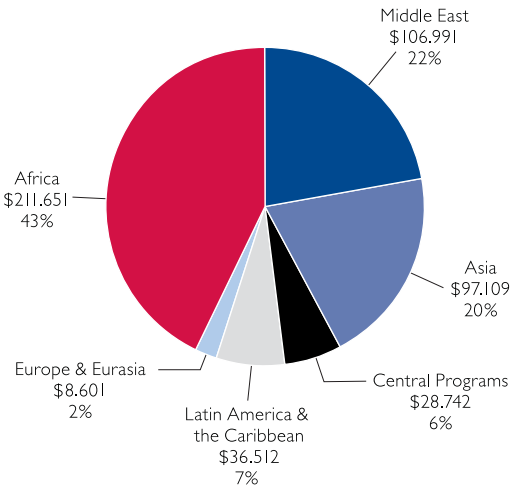
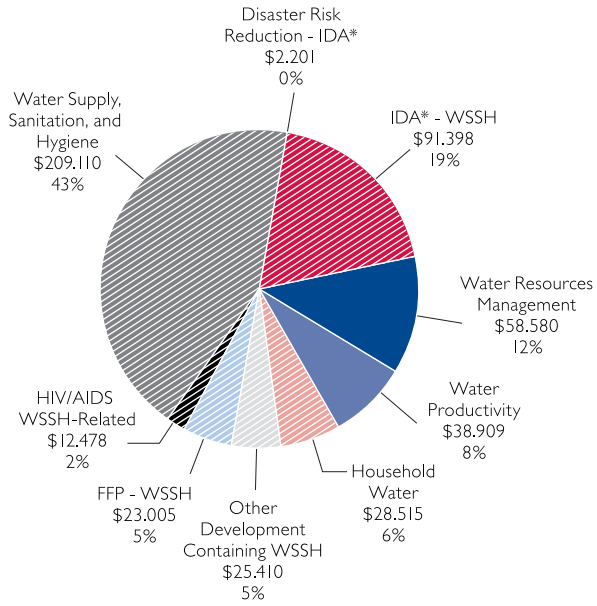


Figure 3: Estimated USAID Water Sector Obligations by Funding Theme, FY 2008 Worldwide Funding ($ Millions)

Total $489.6 Million, of which $389.9 million was for WSSH (cross-hatched segments)



* – The majority of International Disaster Assistance (IDA) funding is devoted to WSSH as part of disaster response, but a small portion is also used for disaster risk reduction activities.

followed by the Middle East ($106.7 million, 22 percent) and Asia ($97.1 million, 20 percent) (figure 2).

The Agency water sector portfolio of $490 million comprised $389.9 million WSSH (80 percent), $58.6 million WRM (12 percent), $38.9 million WP (8 percent), and $2.2 million DRR (<1 percent) (figure 3). The WSSH total of $389.9 million (figure 4) broke down into:

- $91.4 million (23 percent), International Disaster Assistance (IDA)
- $23 million (6 percent), Food for Peace (FFP) (Public Law 480) food assistance
- $209 million (54 percent), all other development account-funded WSSH activities in the primary Foreign Assistance Framework Water Supply and Sanitation element (element 3.1.8)
- $28.5 million (7 percent), household water activities
- $12.5 million (3 percent), HIV/AIDS
- $25.4 million (7 percent), all other development program elements and subelements containing WSSH activities, including education (WSSH in schools), health (WSSH in health clinics), democracy and governance (WSSH in municipal services), and WSSH in alternative development (WSSH in communities receiving antidrug development assistance)

USAID also fulfilled the congressional directive in the FY 2008 Consolidated Appropriations Act Public Law [PL] 110-161, Dec. 26, 2007), which states:

> *… of the funds appropriated by this Act, not less than $300,000,000 shall be made available for safe drinking water and sanitation supply projects, including water management related to safe drinking water and sanitation, only to implement the Senator Paul Simon Water for the Poor Act of 2005 (Public Law 109-121) …*

The Agency fulfilled the rescission-reduced water earmark with FY 2008 funding of $296.65 million[3] for ac-

[3] This amount represents the $300 million FY 2008 water earmark minus rescission and reduction to address food security. A budget rescission is an action by the President canceling budget authority (BA) previously appropriated but not yet obligated or spent. If both houses of Congress do not approve the proposed rescission within 45 days, the President must obligate the BA as intended by the Congress.

tivities meeting the earmark criteria, defined by USAID as follows:

> *The purpose of this earmark is to increase sustainable access to safe drinking water and sanitation and improve hygiene. Eligible activities must have a stated intent to address these goals as a primary or secondary objective and demonstrate that intent through objectively verifiable indicators linked to these goals.*

Congressional and Agency Background

The congressional increase of the USAID water earmark to $300 million in FY 2008 represented the third escalation of the earmark since 2003. Previously, in FY 2006, Congress increased the directive for "drinking water supply projects and related activities" through the Foreign Operations, Export Financing, and Related Programs Appopriations Act (PL 109-102, Nov. 14, 2005) from $100 million (the level set from 2003 to 2005) to $200 million. The Revised Continuing Appropriations Resolution (PL 110-5, Feb. 15, 2007) applied the $200 million FY 2006 directive to FY 2007 ($198 million, after rescission).

On June 1, 2006, following the enactment of the Senator Paul Simon Water for the Poor Act of 2005 (PL 109-121, Dec. 1, 2005), the State Department – with USAID and other U.S. Government support – submitted a report to Congress containing a comprehensive strategy for implementing the Water for the Poor Act. The USAID programs, projects, and activities that address safe drinking water and sanitation supply and related water resources management, and which are described in the present report, reflect USAID's continuing efforts to implement that strategy with the State Department and other U.S. Government agencies. During FY 2008, these efforts were carried out in the State Department and at USAID in a second year of reforms implementing the new "Framework for Foreign Assistance," which includes an "operational plan" process that uses the Foreign Assistance Coordination and Tracking System (FACTS). Much of the information provided in the present report is derived from information made available through FACTS, as submitted by all USAID operating units as of March/April 2009.

Figure 4: Estimated USAID Water Supply, Sanitation, and Hygiene Obligations by Funding Theme, Including Int'l. Disaster Assistance and Food for Peace, FY 2008 ($ Millions)

$389.9 Million (80% of Total)

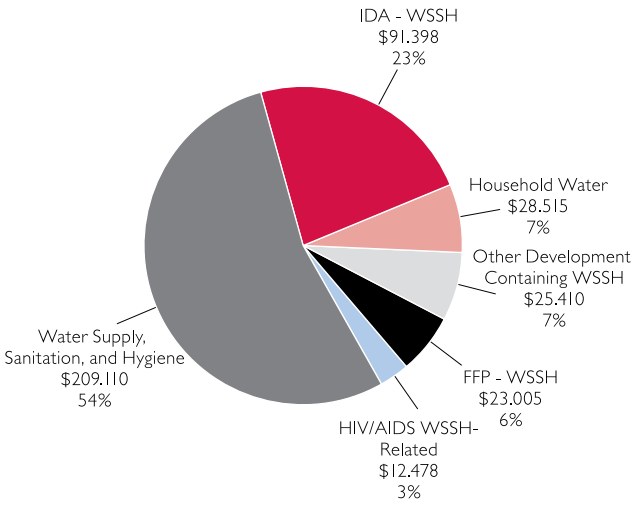
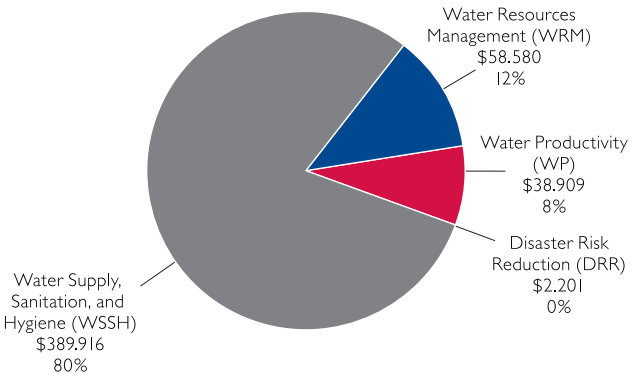


Figure 5: Estimated USAID Water-Related Obligations and Commitments by Theme, FY 2008 ($ Millions)

Total $489.6 Million



In FY 2008, USAID investments in safe drinking water and sanitation supply projects reached $389.9 million, the highest level from normal annual appropriations (supplemental appropriations not included) since USAID began tracking Agency funding levels in its water sector in 2000.

FY 2008 Funding and Results for "Safe Drinking Water and Sanitation Supply Projects, Including Water Management Related to Water and Sanitation"

The water directive in the Consolidated Appropriations Act 2008 (less rescission and exemption for food security), resulted in a 2008 level of funding of $296.65 million. USAID's official budget allocation decisions for the FY 2008 water earmark funds by region, operating unit, and funding account are shown in table 1. Table 10 in the appendix gives these figures by individual country. The funding shown in table 1 includes $263.5 million from all development accounts, such as Development Assistance, the Economic Support Fund, Child Survival and Health, and the Global HIV/AIDS Initiative.

The number of people receiving either first access to improved water supply (approximately 4.63 million) or im-

Overall USAID Water Sector Funding Trends

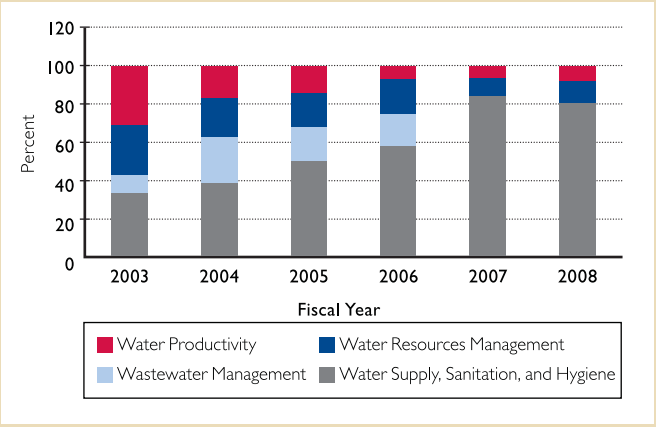
In 2008, water supply and sanitation (WSS) funding levels directed at safe drinking water and sanitation supply projects made their most dramatic increase in the six-year period since 2003, reaching a level of $389.9 million. This was the highest level of funding from normal development appropriations sources (not including supplemental appropriations for Afghanistan or Iraq or other activities) recorded since careful tracking of USAID water sector funding levels began in 2000.

Water resources management (WRM) and water productivity (WP) funding also increased dramatically between 2007 and 2008, with WRM increasing from $28 million to more than $58 million and WP from $17 million to nearly $40 million. These figures represented dramatic reversals of an uninterrupted decline that began in 2000 and reached its lowest level in 2007. The 2008 increases from 2007 were still not sufficient, however, to return non-WSS funding to the level that preceded the long-term period of decline from FY 2003 to FY 2007, during which combined funding for WRM, WP, and disaster risk reduction dropped from approximately $236 million to approximately $50 million. The increase from $50 million in 2007 to $99.7 million in 2008, although significant, was not large enough to restore the level of funding of non-WSS investments to the level that prevailed in 2003.

The total FY 2008 water sector funding within USAID of $489.6 million showed a significant reversal of the funding decline that took place during the previous five years, from almost $400 million per year in 2003–2004, to slightly more than $300 million during 2005 and 2006, and then to only $263 million in 2007.

The congressional directives for "safe drinking water and sanitation supply projects" increased from $100 million between 2003 and 2005 to the 2006–2007 level of $200 million and then to $300 million in 2008. Accordingly, WSS rose as a percentage of all water sector obligations and commitments from 40 percent to more than 80 percent between 2003 and 2007, while WRM and WP, taken together, dropped from more than 60 percent to less than 20 percent. This percentage pattern began a modest reversal in 2008, with safe drinking water and sanitation supply projects dropping from about 82 percent of the USAID water sector budget to 79 percent. The entire USAID water sector portfolio increased from $263 million in 2007 to nearly $490 million (86 percent increase) in 2008, and all WSS activities increased from $213 million to nearly $390 million (83 percent increase).

Figure 6: Estimated USAID Obligations for Water by Theme, FYs 2003–2008* (as a percentage of total funding for that FY)



*** FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.**

Table 1: Allocations from Foreign Assistance Accounts to Meet the 2008 Statutory Requirement on Water Supply, Sanitation, and Hygiene Activities by Region/Operating Unit and Funding Account* ($ Millions)*

*** FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.**

	Total	DA	CSH	ESF	AEECA	IDA	GHAI
Africa	108.252	52.084	13.500	15.200	0.000	15.000	12.468
Asia	74.988	54.864	12.700	7.424	0.000	0.000	0.000
Middle East	57.000	0.000	0.000	57.000	0.000	0.000	0.000
Unallocated	18.103	0.000	0.000	0.000	0.000	18.103	0.000
Latin America & the Caribbean	16.491	10.762	2.500	3.219	0.000	0.000	0.010
Central Programs	14.286	9.086	5.200	0.000	0.000	0.000	0.000
Europe & Eurasia	6.030	0.000	0.000	0.000	6.030	0.000	0.000
Oceans & Int'l Environment & Scientific Affairs (OES)	0.500	0.000	0.000	0.500	0.000	0.000	0.000
TOTAL	**296.650****	**126.796**	**33.900**	**83.343**	**6.030**	**33.103**	**12.478**

** This amount represents the $300 million FY 2008 water earmark minus rescission and reduction to address food security.

ACRONYMS: DA = Development Assistance; CSH = Child Survival and Health Fund; ESF = Economic Support Fund; AEECA = Assistance for Europe, Eurasia, and Central Asia; IDA = International Disaster Assistance; GHAI = Global HIV/AIDS Initiative

Table 2: FY 2008 Number of People with Access to Improved Drinking Water Supply and Sanitation Facilities, and Liters of Drinking Water Disinfected with Point-of-Use (POU) Treatment Products by Region/Operating Unit

	Access to Improved Drinking Water Supply	Access to Improved Sanitation Facilities	Liters of POU-Disinfected Drinking Water
Africa	1,195,570	579,521	5,959,681,782
Asia	2,221,695	1,060,750	287,167,000
Middle East*	3,807,000	4,421,475	-
Central Programs-USAID Global Health	-	-	1,171,333,800
Europe & Eurasia	51,149	-	-
TOTAL	**7,739,566**	**6,290,891**	**7,427,182,582**

* USAID/Jordan reported people with "improved supply access" and people with "improved sanitation access."

Table 3: Actual FY 2008 Obligations across Regions and Central Programs by Selected Subcategories of Water-Related Activities ($ Millions)*

*** FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.**

Water-Related Activities beyond Water Supply and Sanitation	Africa	Asia	Middle East	Europe & Eurasia	Latin America & the Caribbean	Central Programs	Total
Water Resources Management**	12.691	24.009	8.400	0.788	10.031	2.661	58.580
Water Productivity***	25.131	3.760	2.920	0.816	2.060	4.222	38.909
Disaster Risk Reduction						2.201	2.201
Grand Total	**37.822**	**27.769**	**11.320**	**1.604**	**12.091**	**9.084**	**99.690**

Table 4: Estimated USAID Water Obligations in FY 2008 by Region ($ Millions)*							
* FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.							
All Water-Related Activities	**Africa**	**Asia**	**Middle East**	**Europe & Eurasia**	**Latin America & the Caribbean**	**Central Programs**	**Total**
Water Supply and Sanitation	101.275	54.237	74.096	6.247	19.997	19.658	275.51
IDA-Funded Water Supply and Sanitation	58.949	8.103	21.575	0.75	2.024		91.401
FFP-Funded Water Supply and Sanitation	13.605	7			2.4		23.005
Total Water Supply Projects and Related Activities	173.829	69.34	95.671	6.997	24.421	19.658	389.916
Water Resources Management	12.691	24.009	8.4	0.788	10.031	2.661	58.58
Water Productivity	25.131	3.76	2.92	0.816	2.06	4.222	38.909
Disaster Risk Reduction						2.201	2.201
All Water Management Activities	37.822	27.769	11.32	1.604	12.091	9.084	99.69
Grand Total – All Water Funding Categories	**211.651**	**97.109**	**106.991**	**8.601**	**36.512**	**28.742**	**489.606**

proved access (3.11 million in Jordan) rose to 7.74 million in 2008, and people receiving either first access to improved sanitation (2.17 million) or improved access to sanitation (4.12 million in Jordan) numbered 6.29 million. Table 2 provides these figures by region and table 11 in the appendix provides them by country, as reported through FACTS.

The amount of drinking water treated with point-of-use disinfection products partially or wholly supported by USAID in 2008 reached nearly 7.5 billion liters in more than 10 countries; Africa had the most liters of safe drinking water treated – more than 5 billion – with Zambia (2.12 billion), Madagascar (1.82 billion), and Kenya (1.65 billion) reporting the largest safe water treatment totals.

The definitions of the "numbers of people" indicators under the Water Supply and Sanitation element in the new Framework for Foreign Assistance focus on numbers of people receiving "access to improved" water supply and "access to improved" sanitation, and were changed to correspond with the definitions used by the United Nation's Joint Monitoring Program (JMP) to measure progress toward the internationally agreed-upon Millennium Development Goals (MDGs) on water supply and basic sanitation. Before 2007, USAID reported "numbers of people receiving improved access" to water supply and sanitation. Those reported under this definition often already had some form of access to an improved water supply or improved sanitation, based on the JMP definitions, but their level of service was further "improved." The difference between the MDGs' "access to improved" and USAID's previous use of "improved access" is important because the MDGs' "access to improved" refers to people who are receiving their first access to an improved water supply or improved sanitation – these are people (usually the very poor in urban slums or small rural villages) who did not previously have such access.

Another Source of Information –
The Senator Paul Simon Water for the Poor Act Report to Congress

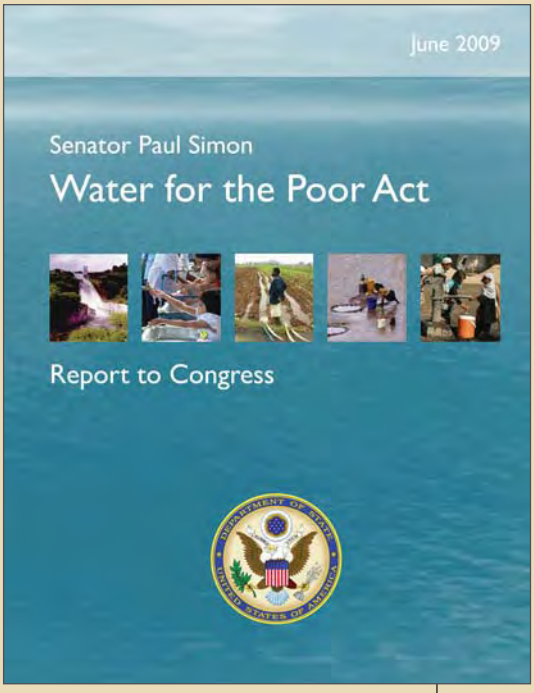
Several sections of the U.S. State Department's 2009 *Senator Paul Simon Water for the Poor Act Report to Congress* (June 2009) (http://www.state.gov/documents/organization/125643.pdf) also contain important and notable content that may be of interest to readers of this USAID report.

Specifically, chapter 4 – "Strengthening the U.S. Strategy on Water and Sanitation" – has sections on:

- Pro-poor approaches to increasing access to water and sanitation
- Responding to climate change
- Using water to increase food security

In addition, annex A contains country-specific water and sanitation plans for the following 14 of 31 priority countries for U.S. water and sanitation activities:

Armenia	Madagascar
Ethiopia	Mozambique
Georgia	Nigeria
Haiti	Pakistan
India	Philippines
Indonesia	Sudan
Jordan	Tanzania



"U.S. water activities directly contribute to the achievement of U.S. foreign assistance goals by protecting human health, promoting economic development and food security, advancing peace and security, and providing basic needs in response to natural and human-made disasters. To achieve those goals, the United States is working with countries around the world to achieve water security – defined as reliable and sustainable access to an acceptable quantity and quality of water to meet human, livelihood, ecosystem, and production needs while reducing the risks from extreme hydrological events to people, the environment, and livelihoods."

– from the Senator Paul Simon Water for the Poor Act Report to Congress, June 2009

1. Safe Drinking Water Supply, Sanitation, and Hygiene Activities

Women obtaining water in rural Ethiopia. In approximately 90 percent of Ethiopian households, women shoulder the responsibility of water collection, often having to walk for several hours each day to fetch water from unclean sources.

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More than 1 billion people worldwide lack access to improved water supply services, and more than 2 billion people lack access to improved sanitation, undermining efforts to generate economic growth, promote social development, and protect public health. In many developing countries, the time and effort required to obtain water for daily use detracts from time and activities that could be devoted to education and other productive employment. Girls, who are usually tasked with the duty to fetch household water, suffer the greatest burden of education lost to the pursuit of water, while young children are particularly vulnerable to water- and sanitation-related threats to health. Unsafe drinking water, inadequate sanitation, and poor hygiene cause nearly 2 million deaths from diarrhea each year – the vast majority in children under age 5 – and unsafe drinking water is the cause of nearly 90 percent of diarrhea incidence.

The economic, social, and health consequences of limited access to clean water and improved sanitation services are thus enormous, and the underlying causes of this limited access are diverse. They include competition for and inadequate management of water resources; ineffective institutions and related human resources; shortfalls in financing; and lack of effective demand, especially for sanitation. Success in these areas is linked to many U.S. Government foreign assistance priorities.

To address these problems, USAID's comprehensive WSSH activities support the three pillars required for sustainable access and use of improved water supplies and sanitation. Increased coverage is not sufficient. Only with consistent and correct practice of handwashing with soap, safe feces disposal, and safe drinking water treatment, if needed, and drinking water storage that prevents recontamination, are health and social benefits realized. The three pillars of effective WSSH are:

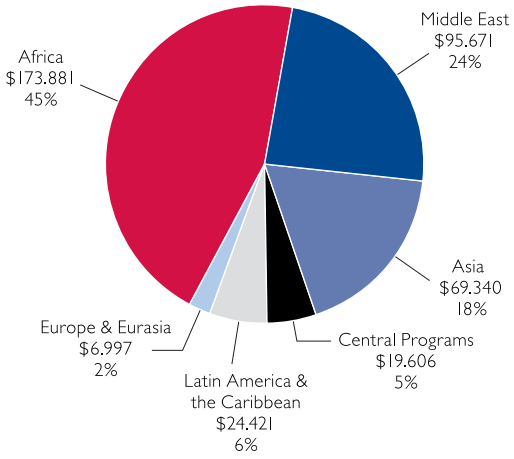
- *Access to appropriate hardware and supplies* – Municipal and community water supply systems and sewers, household sanitation facilities, and other household-level technologies and products, such as soap and handwashing devices

- *Hygiene and sanitation promotion, behavior change, and demand creation* – Community mobilization for sustained management of drinking water supply and latrine building; social marketing of products and behaviors like point-of-use (POU) drinking water treatments and sanitation options; magnifying messages through media and communication; and water, sanitation, and hygiene (WASH) promotion through school and health clinic programs

- *Enabling environment* – Improved policies, institutional support, community organization, finance and cost recovery, and public-private partnerships for improved water supply, sanitation, and hygiene

Figure 7: USAID Water Supply, Sanitation, and Hygiene Obligations, Including IDA & FFP, by Region, FY 2008 ($ Millions)

$389.9 Million (80% of Total Water Obligations*)



USAID's long experience with best practices in these areas suggests that investments should focus on five programming activities:

- Strengthening the capacity and sustainability of small-scale service providers who operate in rural and peri-urban areas

- Improving the operating environment, operations, and financial sustainability of utilities that serve cities and towns undergoing the most rapid population growth

- Improving household- and community-level hygiene and sanitation

- Mobilizing capital from domestic markets for infrastructure development on a permanent and sustainable basis

- Integrating water supply and sanitation with humanitarian assistance/disaster risk reduction and response programs

USAID's safe drinking water supply projects and related activities specifically address 1) the provision of clean and adequate supplies of drinking water to rural and urban communities and 2) the promotion of practices that protect these supplies from contamination by improper handling of domestic water and household waste and inadequate sanitation. They include water well development, improvement, or rehabilitation; water delivery systems; removal of contaminants through both large-scale water treatment and small-scale or household POU treatment; and drinking water source protection. USAID activities also address the need to improve the capacity of municipal and community governments and both public and private organizations to deliver potable water and sanitation infrastructure services in a sustainable, cost-effective, and water-efficient manner. Additional activities include legal, regulatory, and governance reforms needed to sustainably finance, operate, and maintain such infrastructure.

USAID Works in Countries with Greatest Burdens of Diarrhea-Related Child Deaths

In 2008, a systematic and comprehensive literature review undertaken by the Child Health Epidemiology Reference Group, an external advisory group coordinated by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), estimated that worldwide in 2004 there were 1.87 million deaths caused by diarrhea among children under age 5, accounting for nearly 20 percent of all under-5 deaths. An estimated 90 percent of diarrheal disease is attributed to unsafe drinking water, inadequate sanitation, and poor hygiene. Nearly three-quarters of diarrhea deaths in 2004 occurred in 15 countries in Africa and Asia, as shown in the table below.* In 2008, USAID provided support for water supply, sanitation, and hygiene activities in all of these countries,** either through its country or regional Missions or through disaster assistance.

Estimated Under-5 Deaths from Diarrhea, 2004 – Top 15 Countries*

Africa			Asia		
Country	**Est. deaths (000s)**	**Global rank**	**Country**	**Est. deaths (000s)**	**Global rank**
Nigeria	175	2	India	535	1
Dem. Rep. Congo	95	3	Pakistan	77	5
Ethiopia	86	4	China**	75	6
Angola	34	10	Bangladesh	69	7
Niger	33	11	Afghanistan	65	8
Uganda	28	12	Indonesia	39	9
Tanzania	25	14	Myanmar**	26	13
Mali	24	15			

* Source: Cynthia Boschi-Pinto, C., Velebit, L., & Shibuya, K. 2008. "Estimating child mortality due to diarrhoea in developing countries." Bulletin of the World Health Organization 86:710–717.
**USAID operations in China and Myanmar are limited.

WSSH Activities by Region and Country

AFRICA

Table 5: Top Receiving Countries, WSSH Funding,* Africa, FY 2008

Receiving countries	$ (millions)	Percent
Sudan	51.8	31.6
Dem. Republic of the Congo	15.0	9.1
Ethiopia	13.8	8.4
Somalia	10.6	6.4
Uganda	8.5	5.2
Kenya	8.4	5.1
Madagascar	6.1	3.7
Mozambique	4.7	2.9
Nigeria	3.7	2.3
Zambia	2.5	1.5
Senegal	2.3	1.4
Zimbabwe	2.1	1.3
Tanzania	2.0	1.2
Chad	1.8	1.1
Eritrea	1.4	0.9
Other (13 countries, 4 Regional Missions)	29.3	17.9
Total WSSH/Africa	**164.0**	

* Estimated obligations and commitments

Countries Receiving USAID WSSH Assistance, Africa, FY 2008

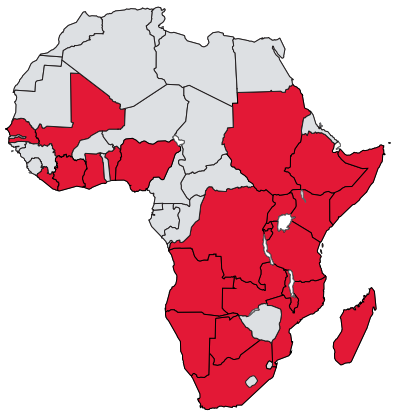
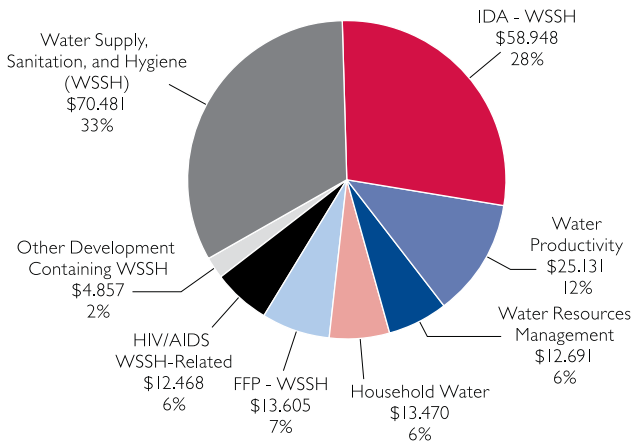
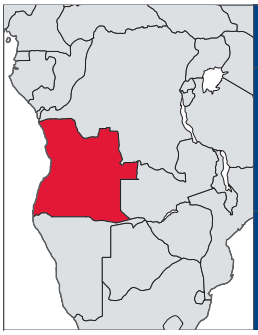


Figure 8: Estimated USAID Water Funding Obligations by Theme, Africa, FY 2008 ($ Millions)

$211.7 Million (43% of Total)



Angola



Population	15.9 million
% population lacking access to improved drinking water supply (2006)	urban: 38
	rural: 61
% population lacking access to improved sanitation (2006)	urban: 21
	rural: 86

Sources for above statistics for Angola and other countries covered in this chapter: Population – Population and Vital Statistics Report, United Nations, 2009. Access to improved drinking water and sanitation – Joint Monitoring Programme for Water Supply and Sanitation, WHO and UNICEF. Diarrhea deaths – WHO, Department of Measurement and Health Information, Estimated Total Deaths ('000), by Cause and WHO Member States, 2002

Widespread unsanitary practices, primarily defecation in open spaces and not washing hands with soap at critical times, as well as the consumption of contaminated drinking water, are widespread in Angola and remain major causes of child mortality, especially among the poor and in rural areas. Results from a 2007 study by the United Nations Children's Fund (UNICEF) suggest that 10.5 million people routinely practice unsafe means of disposing of excreta. According to national epidemiological data, 18 percent of deaths among children under age 5 are attributed to diarrhea, meaning five children die every hour from water- or sanitation-related diseases. In addition, water, sanitation, and hygiene conditions have been worsened by the devastating effects of 30 years of internal conflict.

USAID Activities to Meet the FY 2008 Water, Sanitation, and Hygiene Directive for Sub-Saharan Africa (as of March 2009)

Washing in the Cuebe River, Angola.

The FY 2008 Consolidated Appropriations Act stated that "not less than $300,000,000 shall be made available for safe drinking water and sanitation supply projects and water resources management activities related to safe drinking water and sanitation, of which not less than $125,000,000 should be made available for programs in Africa." USAID's Africa Country and Regional Missions are putting this funding to productive use, with tangible activities in place to increase the access of Africans to safe drinking water, sanitation, and hygiene – all critical components to the region's health and economic development.

More than half of the 20 African Missions with water earmark activities are implementing programs to improve sanitation and hygiene in schools, creating a safe and healthy environment for learning. The activities include handwashing campaigns, construction of improved latrines, and ensuring that schools have safe water supplies. Such improvements are known to have a direct impact on the attendance of children in school – especially girls – and on the retention of teachers. In some countries, such as Benin, education has expanded to include mass media radio spots to ensure that messages are spread as widely and efficiently as possible.

Other Missions are focusing on mothers and children, the most vulnerable members of the population, with 17 working directly on maternal and child health and improving household sanitation and hygiene practices through education and improved conditions. In Uganda, FY 2008 saw a transition from ongoing humanitarian assistance to development programs that established sustainable services in northern urban centers. Displaced persons will be able to return to their homes of origin once services such as water and sanitation are in place.

USAID is also working to ensure that the sanitation sector in Africa's rural areas is not neglected. In examining progress toward the Millennium Development Goal targets for water and sanitation in Africa, it is clear that progress in rural settings – in sanitation in particular – poses greater challenges than progress in urban settings. Ten Missions are already working on rural-targeted programs that support small-scale infrastructure, training for village-level entrepreneurs, and strengthened water users/managers associations in order to facilitate sustainable access to rural water and sanitation. Nineteen Missions are providing targeted support for expanded sanitation services, with activities ranging from building latrines to advising on the safe disposal of waste.

Overview of USAID WSSH Activities in Sub-Saharan Africa

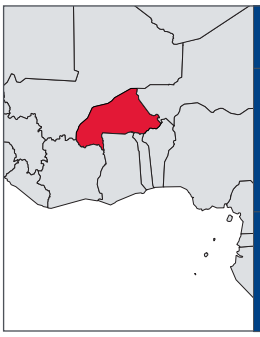
- WSSH earmark attributions in 20 Africa Country Missions and four Regional Missions totaled approximately $72 million in FY 2008.
- Nearly $48 million is being programmed through the Water Supply and Sanitation element (element 3.1.8) in the Development Assistance Framework (DAF).
- Approximately $26 million in funding is being programmed just through DAF subelements 3.1.8.1 (safe water access) and 3.1.8.2 (basic sanitation).
- Almost $6 million in funding is being programmed through DAF 3.1.6.8 (household-level water, sanitation, and hygiene).

In FY 2008, USAID/Angola utilized $950,000 to increase access to improved drinking water supply and sanitation. This support was directed at:

- Improvements to community water points (36 boreholes built or rehabilitated)
- Improved water and sanitation facilities for schools (construction of four boreholes, four sanitary toilets, and the training of eight teachers on hygiene education)
- Social mobilization for community-based management of water supply facilities (training in hygiene promotion and self-construction of latrines for four municipal water brigades, 36 water and sanitation groups, and 20 community agents)

In partnership with other donors, USAID also supported Population Services International (PSI) in promoting the locally manufactured Certeza household POU water treatment product, along with improved hygiene. USAID's support will help expand the scope of the PSI project to a national scale. Certeza will be made available to stores, clinics, nongovernmental organizations (NGOs), and community-based networks, with the goal of selling 200,000 bottles in FY 2009. A complementary behavior change communication campaign will disseminate information about the importance of water treatment, as well as good hygiene and handwashing. The campaign will target caregivers of children under age 5 and address the links among diarrheal disease, water, and the home environment.

Burkina Faso



Population	13.1 million
% population lacking access to improved drinking water supply (2006)	urban: 3
	rural: 34
% population lacking access to improved sanitation (2006)	urban: ND
	rural: ND

In FY 2008, Africare built 29 drinking water wells benefiting 8,700 persons. Additional projects included the construction of four springs in four villages, benefiting 1,200 people. Behavior change communication activities addressed safe food preparation, body hygiene and hygiene around water points, handwashing, latrine use, and prevention of waterborne diseases.

Burundi

Population	7.5 million
% population lacking access to improved drinking water supply (2006)	urban: 16
	rural: 30
% population lacking access to improved sanitation (2006)	urban: 56
	rural: 59

USAID/Burundi applied $550,000 in FY 2008 water funding to support a cleaner drinking water supply; promote improved hygiene and sanitation practices; and promote efficient water management and cleaner production technologies that reduce river and ground water pollution in coffee, dairy, and horticulture production. Members of the coffee, horticulture, and dairy farmers associations received training on clean water use, water source protection, water purification, water harvesting and storage, and workplace and household hygiene and sanitation. The associations received small awards totaling $200,000 to rehabilitate clean water sources and build water harvesting and storage facilities. Sanitation facilities and systems to reduce the amount of water used and to treat run-off water in order to prevent river and ground water pollution were established at eight USAID-supported coffee washing stations. Other activities included agronomy training, agriculture research, and community outreach on efficient water management.

USAID/Burundi also used FY 2008 water funds to reinforce the Government's efforts to develop an institutional framework for water management, guidelines on water sector reform, and water sector policies related to public health and agriculture. Activities included five workshops to validate the policies and develop an implementation framework, and five workshops to consult with local communities and validate the policies through citizen input.

Democratic Republic of the Congo

(map and data on page 16)

To have a direct and measurable impact on improved health in the Democratic Republic of the Congo, increased access to clean water is one of the most basic and effective investments that U.S. assistance can support. In

Ethiopia

Water Supply, Sanitation, and Hygiene

Population	77.4 million
% population lacking access to improved drinking water supply (2006)	urban: 4
	rural: 69
% population lacking access to improved sanitation (2006)	urban: 73
	rural: 92

In Ethiopia, water- and sanitation-related illnesses represent a major disease burden, accounting for more than 75 percent of the cases registered in outpatient departments of public sector health facilities. The Government's multidonor-supported Water Sector Development Program is designed to improve access to safe water, and the National Hygiene and Sanitation Policy promotes universal access to sanitation. In addition, the Ministry of Health's Health Extension Program promotes health, sanitation, and hygiene at the community level through salaried female health extension workers and community volunteers. The Government expects the active participation of communities, sector offices, NGOs, and donor agencies in implementing these ambitious policies and strategies.

In FY 2008, a USAID-supported NGO consortium established 91 protected water schemes in 26 districts. USAID health programs supported the rehabilitation of 12 water schemes and the construction of 29 latrines for schools and more than 5,200 household pit latrines. These efforts brought safe drinking water to nearly 70,000 people and improved sanitation to more than 35,000 people. They also provided more than 42,000 schoolchildren with gender-specific latrines. Water, sanitation, and hygiene (WASH) committees were established at each water scheme and were made responsible for overall water management and the promoting of sanitation and hygiene in their communities. USAID trained 888 WASH committee members in water scheme operation, maintenance, and financial management, and trained nearly 77,000 people in sanitation and hygiene education. USAID also helped the Southern Nations, Nationalities and Peoples (SNNP) Regional Health Bureau control a cholera epidemic and strengthened case management in affected villages.

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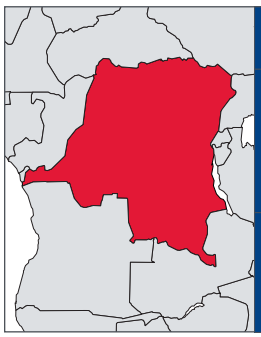
A woman bathing her infant at a community water pump.

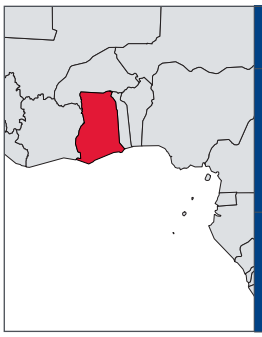
U.S. support also improved access to water for pastoralist populations by rehabilitating traditional watering points. Ongoing work of the Pastoralist Livelihoods Initiative (PLI) improved access to safe drinking water for more than 500,000 beneficiaries. More than 70 traditional water points were improved or rehabilitated and now provide access to water for animals as well, protecting pastoralist livelihoods. In three regions, 25 PLI-constructed livestock market facilities opened in 2008, providing water to both humans and their livestock on weekly market days. USAID also developed water points, treated drinking water, and promoted hygiene for poor rural communities under the Productive Safety Net Program, funded by Food for Peace program resources. The USAID Office of U.S. Foreign Disaster Assistance also provided support for emergency water tankers in the Somali region; a countrywide rapid response program focused on small-scale emergencies, including floods, cholera outbreaks, and population displacement; and latrine construction and maintenance, hygiene education, and safe drinking water to reduce the spread of waterborne diseases in Oromiya, SNNP, Gambella, and Amhara regions. Through the U.S. President's Emergency Plan for AIDS Relief, USAID/Ethiopia will also provide 75,000 HIV-positive people with point-of-use safe water products and water vessels.



Population	57.5 million
% population lacking access to improved drinking water supply (2006)	urban: 18
	rural: 71
% population lacking access to improved sanitation (2006)	urban: 58
	rural: 75

FY 2008, maternal and child health funds were applied to water and sanitation activities in support of basic health services targeting women and children. Achievements included the rehabilitation of 122 protected water sources and construction of 114 latrines in health centers. Other funds were applied to a new five-year program to expand access to health services that will include support for a rapid expansion of access to clean drinking water and improved sanitation services. For FY 2009, USAID began discussions to develop a new Global Development Alliance water sector partnership with Proctor and Gamble to provide access to water treatment products and education. To expand access to clean water and improved sanitation services, the Mission hopes to establish other public-private partnerships, possibly with mining companies in Katanga province, where recurring cholera outbreaks could be addressed through a combination of access to safe water sources, water treatment and storage improvements, and sanitation and hygiene services.

Ghana



Population	22.1 million
% population lacking access to improved drinking water supply (2006)	urban: 10
	rural: 29
% population lacking access to improved sanitation (2006)	urban: 85
	rural: 94

USAID and other development partners support more than 90 percent of water- and sanitation-related development activities in Ghana, which aims to reach its MDG levels of 76 percent coverage for access to safe drinking water and 65 percent coverage for improved hygiene and sanitation facilities by 2015. USAID is assisting in this effort, which will also serve to reduce waterborne diseases such as guinea worm.

In 2008, USAID provided 14 boreholes that reached 5,600 people in rural communities. The Mission also identified key opportunities for action with anticipated increased USAID water and sanitation resources in 2009. These include:

CURT CARNEMARK

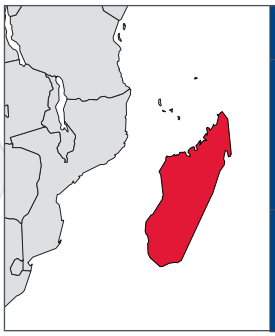
Ghanaian women and children transporting water for home use.

- Introducing the Aquatab POU water purification product, publicizing its availability in the private sector, and expanding a network of female sales agents, with a focus on underserved rural communities

- Supporting construction of sanitation facilities in rural communities, around schools and health facilities, and at public transportation centers, with support for local communities or organizations, such as transport unions, health committees, and parent-teacher associations, to ensure their use

Madagascar

Water Supply, Sanitation, and Hygiene



Population	18.6 million
% population lacking access to improved drinking water supply (2006)	urban: 24
	rural: 64
% population lacking access to improved sanitation (2006)	urban: 82
	rural: 90

USAID's FY 2008 activities in Madagascar influenced child health through the prevention of major causes of child mortality, such as diarrhea and other water-related diseases, in a country where less than 35 percent of the population has access to both safe drinking water or adequate sanitation. These activities included the following:

Community education, social marketing: A USAID-supported network of community health workers (CHWs) provided health and hygiene education and sold social marketing products, such as safe water treatment solution and jerry cans with spigots. CHWs sold more than 380,000 bottles of the inexpensive, easy-to-use chlorine water treatment Sûr'Eau, which provided more than 762 million liters of treated water for rural Malagasy families. In total, 1.2 million bottles were sold or distributed nationally, providing more than 1.8 billion liters of treated drinking water. USAID also trained and supported CHWs to negotiate with families to adopt "small doable actions," including covering treated water and using improved clay pot water storage tanks or handwashing stations.

CRYSTAL THOMPSON/AED

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

WASH: The Water, Sanitation, and Hygiene (WASH) program supported a social marketing campaign to increase knowledge about and improve access to safe water and hygiene facilities. National radio and TV stations regularly aired educational and promotional programs, and movies at 1,242 events, reaching of more than 120,000 people. USAID also implemented WASH-friendly schools and health centers that ensured access to water supply, latrines, and handwashing facilities. About 90,000 community members implemented the three key practices: handwashing with soap, safe feces disposal, and safe drinking water storage and treatment.

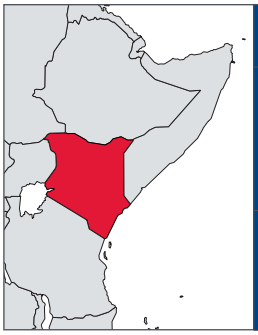
Rural infrastructure: USAID increased sustainable access to improved water sources and hygienic sanitation facilities in rural areas. USAID conducted baseline surveys in eight target regions and trained village-level technicians, masons, and plumbers in the construction of low-cost water and sanitation infrastructures. NGO staff, community representatives, and commune-level authorities received training in enforcing national water laws. USAID developed a field guide that stressed the importance of each commune managing and maintaining its water supply infrastructure.

Food aid water support: Title II food aid resources gave 2,250 households (nearly 15,000 people) access to safe water through improved water systems. Activities to increase access to improved sanitation reached 1,265 people.

Well partnership: USAID negotiated a partnership with an innovative social enterprise to install and manage wells in extremely remote poor communities. Under the scheme, hand pumps remain the property of the partner enterprise, but the wells are the property of the commune. Pumps are leased to communes for a yearly fee, while the partner guarantees the maintenance and proper functioning of the pumps. The arrangement limits the risks of trying a new approach to maintaining rural water supply.

- Encouraging the construction and use of household toilet facilities

Kenya



Population	34.3 million
% population lacking access to improved drinking water supply (2006)	urban: 15
	rural: 51
% population lacking access to improved sanitation (2006)	urban: 81
	rural: 52

USAID's water and sanitation program is helping Kenya's Government and Kenyan communities improve hygiene and increase access to improved water and sanitation services. Kenya is a water-scarce country, and more than 80 percent of the land is arid or semi-arid. Per capita fresh water availability is projected to decrease by nearly two-thirds by 2025, as the population increases. The country also faces significant deficits in water supply and sanitation service coverage. Less than half of the rural population have access to improved drinking water, with more than half getting their water from rivers, streams, and other unimproved sources. Fewer than 50 percent of households have access to improved sanitation facilities. Traditional pit latrines are predominant in rural areas, with the exception of North Eastern province, where any type of toilet facilities are rare.

In 2008, USAID helped more than 87,000 people gain access to improved drinking water and more than 35,000 to improved sanitation facilities. More than 1.65 billion liters of drinking water were disinfected with USAID support. Household hygiene interventions also helped reduce the prevalence of waterborne diseases. In 2009, USAID/Kenya intends to build on these activities through new programs that will bring improved drinking water to an additional 150,000 people and improved sanitation to 70,000. Women and girls, who are often tasked to fetch water from long distances, will be key beneficiaries. Women's involvement in managing water projects will be critical for success.

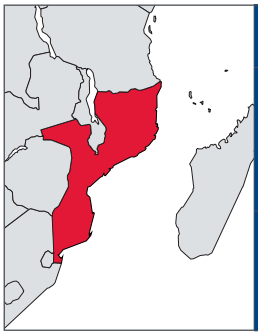
Malawi *(map and data next column)*

Through a subcontract between Abt Associates and PSI, USAID/Malawi continued to expand the Water Guard POU water treatment social marketing program. The goal of the program is to reduce diarrheal disease mortality and

Population	12.9 million
% population lacking access to improved drinking water supply (2006)	urban: 4
	rural: 28
% population lacking access to improved sanitation (2006)	urban: 49
	rural: 38

morbidity of children under age 5 by increasing consistent and appropriate use of POU water treatment products by primary caregivers. In FY 2008, more than 231 million liters of water were treated. An increase in treatments is projected for FY 2009 due to the use of a new Water Guard bottle that treats 66 percent more water per bottle and for which the program has set aggressive sales growth targets.

Mozambique

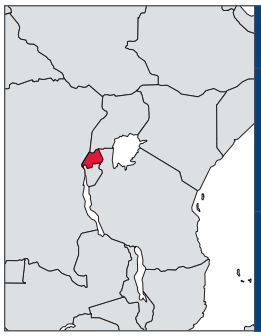


Population	19.8 million
% population lacking access to improved drinking water supply (2006)	urban: 29
	rural: 74
% population lacking access to improved sanitation (2006)	urban: ND
	rural: ND

USAID water activities in Mozambique focused on reducing diarrhea in children and pregnant women, the target groups of maternal and child health programming, through social marketing of Certeza water purifier. Certeza purifies water regardless of its source (wells, rivers, streams, boreholes, etc.). The USAID-supported social marketing program sold 472,000 bottles of Certeza, thus enabling communities in remote, rural, and peri-urban slum areas to access and consume clean drinking water and thereby reduce the occurrence of diarrheal disease.

Rwanda *(map and data next page)*

USAID/Rwanda invested $323,000 in household water sanitation and hygiene activities, continuing to support the scale-up of the Sûr'Eau POU water treatment product. The program will address the two main community impacts of the unavailability of drinking water, namely diseases caused by unsafe water and the time lost for



Population	9.0 million
% population lacking access to improved drinking water supply (2006)	urban: 18
	rural: 39
% population lacking access to improved sanitation (2006)	urban: 66
	rural: 80

schooling of girls and income-generating activities to fetching water. According to the 2005 Rwanda Demographic and Health Survey, more than 70 percent of rural households must travel more than 15 minutes to any water source.

The Rwanda program joined an array of public, private, and NGO partners, including local leaders, businesses, and community- and faith-based organizations, to promote and distribute a smaller Sûr'Eau bottle with more concentrated product and a new label, and to build social support for the new product. Results included:

- Training 55 peer educators on safe water systems, proper handwashing, and water treatment with Sûr'Eau
- Providing materials on proper handwashing and installing safe water systems for drinking to 22 schools and 12 places of work (including tea factories, health centers, and sector and district offices)
- Reaching more than 13,700 individuals through community outreach, promoting water treatment, proper handwashing, and sanitation

In addition to working with Ministry of Health clinics and their outreach workers, the program developed new distribution systems to reach a greater number of outlets, including private health care practitioners and rural wholesalers and retailers. The program will also train outreach agents as community-based distributors to further expand the program's coverage.

Recognizing that contaminated drinking water from unsafe sources is a significant contributor to diarrheal disease, USAID/Rwanda also supported the PSI Behavior Change and Social Marketing project to expand and improve the Sûr'Eau POU water treatment program. The program was relaunched with World Bank funding targeting people living with HIV/AIDS and a PSI component promoting correct and consistent use of safe water systems, including POU treatment, safe storage, and hygiene. The PSI component targets families with children under age 5, particularly those in rural areas vulnerable to acute diarrheal disease, through behavior change communications, commercial marketing techniques, and expanded distribution.

With 90 percent of people living with HIV/AIDS affected by diarrhea (causing significant morbidity and mortality), USAID also provided support for continued Sûr'Eau distribution through health facilities offering HIV clinical care, as well as support to associations of people who have HIV/AIDS. Community health workers, who have a significant role in providing palliative and other home-based care to people sick with HIV/AIDS, received training on safe water and hygiene activities.

USAID/CARL MITCHELL

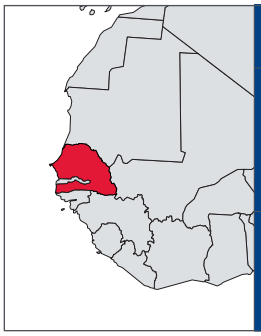
Improved water source, Maputo, Mozambique.

Working with the National Office of Tourism and National Parks, a USAID biodiversity project found there was a need for education on clean water and sanitation and diarrhea prevention in five project districts that are among Rwanda's most densely populated, with a combined population of about 300,000. To address this need, the project supported and helped organize outreach and information, education, and communication activities on clean water with Sûr'Eau, handwashing with soap, prevention of diarrheal diseases, and how to improve sanitation in communities, schools, and workplaces. These activities were organized in conjunction with health centers, health animators, community volunteers, schools, tea factories, national tourism authorities, and other government officials. The project, which focuses on drinking water supply and sanitation in Rwanda's national parks, will also use $18,000 in funding to support household-level water sanitation and hygiene services in and around the Nyungwe Forest.

Another water activity promoted household water sanitation and hygiene to 20,000 members of farmer cooperatives, which are well positioned to reach broad audiences with key health messages.

Senegal *(map and data next column)*

Senegal was a priority country in FY 2008 for USAID water and sanitation activities under the Senator Paul Simon Water for the Poor Act, with $4.4 million supporting a variety of activities, including:



Population	11.7 million
% population lacking access to improved drinking water supply (2006)	urban: 7
	rural: 35
% population lacking access to improved sanitation (2006)	urban: 46
	rural: 91

- Building capacity for water and sanitation governance and providing small grants for water and sanitation infrastructure ($700,000)
- Building wells in middle schools ($300,000)
- Implementing a water and sanitation program that includes maternal/child health activities and builds peace with communities by addressing local water and sanitation needs ($900,000)
- Providing grants to U.S. private voluntary organizations and local NGOs to use integrated approaches to water and sanitation activities ($2.5 million)

Senegal is making progress in achieving the MDG for urban water supply, with lesser prospects for rural water supply and sanitation. USAID thus focused its activities in rural areas of targeted regions, using a cross-sectoral approach to address interrelated social, governance, economic, ecological, sustainability, and capacity challenges. USAID also held discussions with the Coca-Cola Company to create a Water and Development Alliance activity that will complement the Mission's other water activities.

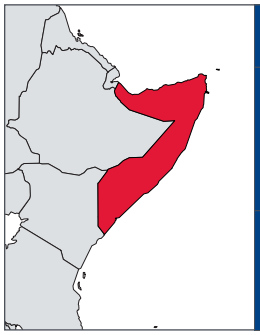
RICHARD NYBERG/USAID

Couple at community pump, Senegal.

Somalia

(map and data next page)

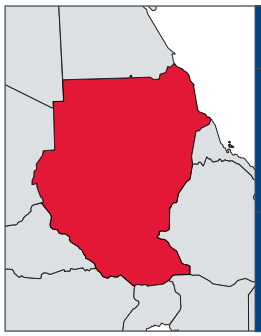
Somalia suffers from a persistent water shortage, exacerbated by the destruction of water supply installations during the civil war and the lack of system maintenance. Throughout the country, drought devastates communities that rely on rainwater ponds,



Population	8 2 million
% population lacking access to improved drinking water supply (2006)	urban: 37
	rural: 90
% population lacking access to improved sanitation (2006)	urban: 49
	rural: 93

shallow wells, and boreholes to provide for both human and livestock needs. In FY 2008, USAID supported water supply and sanitation efforts in Baidoa town in Somalia's south-central region. With USAID support, UNICEF built 40 gender-specific latrines, with complete handwashing facilities and water supply, in Baidoa's schools. This reduced the incidence of water-related diseases through basic sanitation, hygiene, and water safety measures. More than 4,700 students gained access to improved sanitation facilities from the program. The United States is also supporting the establishment of a water supply system in Baidoa, which will benefit about 40,000 people once it is completed.

Sudan

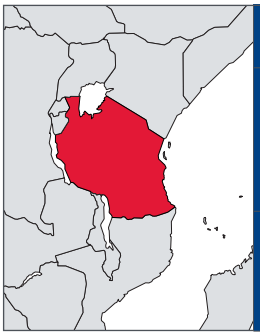


Population	36.2 million
% population lacking access to improved drinking water supply (2006)	urban: 22
	rural: 36
% population lacking access to improved sanitation (2006)	urban: 50
	rural: 76

More than 228,000 Sudanese people accessed improved drinking water in 2008 as a result of USAID activities. USAID resources were used to provide treated water, rehabilitate water distribution infrastructure, and improve sanitation conditions in Juba. More than 176,000 people used POU water treatments on a regular basis, and more than 16,300 Sudanese benefited from good health and hygiene practices. USAID also supported water, sanitation, and hygiene promotion in 145 primary health centers in nine health zones.

Community-based water user committees were developed, and community members received training in operation, maintenance, and administration to ensure their sustainability. Projects to create longer-lasting, sustainable water services in South Sudan also continued, with successes in short-term projects paving the way for longer-term infrastructure projects and institutional capacity building in water and sanitation.

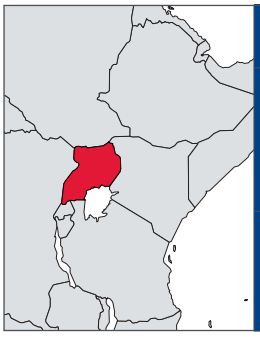
Tanzania



Population	38 3 million
% population lacking access to improved drinking water supply (2006)	urban: 19
	rural: 54
% population lacking access to improved sanitation (2006)	urban: 69
	rural: 66

In support of the Tanzanian Government's national strategy for growth, poverty reduction, and improvement of human health and safety, USAID assessed current watershed conditions and identified threats to water supply and quality. This activity provided valuable real-time data and led to several strategic activities to catalyze efforts to improve water supply, sanitation, resource management, and the planning of protective measures to improve water quality and sustain water flows.

Uganda



Population	28.8 million
% population lacking access to improved drinking water supply (2006)	urban: 10
	rural: 40
% population lacking access to improved sanitation (2006)	urban: 71
	rural: 66

USAID/Uganda continued to invest in the water sector because it contributes to national economic growth. The economic impact of inadequate local access to water is reduced productivity and reduced incomes, as traveling long distances reduces time that could be invested in agricultural production or attending to an enterprise. The need to obtain water also impacts education standards, as children can be routinely absent from school due to household chores, including fetching water. Water is also a major contributor to health issues in Uganda, as three-

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Access to a safe drinking water supply in Africa's large cities is a frequent problem that is often compounded by inadequate attention to wastewater management, as seen in the picture above of drinking water vendors standing in a street flooded with wastewater and stormwater in Nairobi, Kenya. Securing water supplies in urban settings for other uses, such as clothes washing, can also pose challenges, as seen in the picture below from the outskirts of Luanda, Angola.

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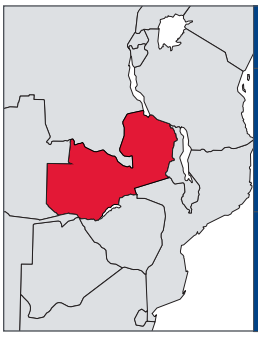
quarters of the country's disease burden is thought to be caused by poor hygiene and sanitation.

In FY 2008, the USAID/Coca-Cola Global Development Alliance completed a $500,000 project that installed 21 boreholes and constructed seven ventilated pit latrines in and around schools for use by students. To ensure sustainability, the project provided training to members of the water user committees, who will oversee fees collection and maintenance. More than 30,000 people in seven locations in northern Uganda are benefiting from this effort. USAID also awarded a $3 million contract to implement the Northern Uganda Water Supply Services (NUWSS) project. The project conducted a situation analysis in the conflict-affected town of Kitgum that revealed that it has piped water for only 30 percent of its 50,000 inhabitants. Furthermore, when it is operational, the system only runs at 20 percent of capacity. During FY 2009, NUWSS will increase water production and distribution points for the towns of Kitgum and Pader to improve sustainable and efficient access to water in these areas of conflict-affected northern Uganda.

USAID also collaborated with the U.S. Department of Defense's Combined Joint Task Force-Horn of Africa, which is providing access to clean water in northern Uganda. In FY 2008, the Task Force drilled 30 wells and repaired 67 boreholes.

Zambia



Population	11.7 million
% population lacking access to improved drinking water supply (2006)	urban: 10
	rural: 39
% population lacking access to improved sanitation (2006)	urban: 45
	rural: 49

In FY 2008, the United States supported Zambia's pursuit of the MDG of universal access to safe drinking water by the year 2015 through a social marketing program for a POU home water treatment solution; borehole pump procurement and repair at health facilities; installation of water storage tanks; and repair of leaking water pipes and taps. The POU water treatment product provided Zambians with 2.1 billion liters of safer drinking water to help prevent diarrhea in children. The program augmented the safe water education campaigns conducted by the Government and included encouraging good personal hygiene such as regular handwashing and proper storage of water. USAID supported clean water education campaigns through interpersonal communication, radio and television broadcasts, dramas, and print media that disseminated messages to encourage consistent and correct use of the POU product. To sustain home water treatment, USAID contracted out the manufacturing of the solution to Pharmanova, a local manufacturing company.

USAID also provided support to increase availability of clean water for schools, which also afforded opportunities for other education-enhancing activities, such as

school feeding, gardens, and related income-generation activities. In collaboration with the U.S. Department of Defense and Rotary International, USAID supported the installation of PlayPumps at 14 primary schools. These child-friendly merry-go-rounds pump water as the children play on them, making water available for drinking, sanitation, and gardening. Nearly 10,000 students now benefit from the PlayPumps installed in schools.

Linked to U.S. support for tuberculosis and HIV/AIDS activities, USAID also supported public health infrastructure renovations, such as providing borehole water pumps, connecting and restoring water supply to health facilities, installing water storage tanks and handwashing facilities, and repairing leaking water taps.

AFRICA REGIONAL PROGRAM

In addition to the above country programs, USAID's Africa Regional Program implemented water activities in FY 2008. These activities provided almost 400,000 people with improved access to water and more than 60,000 people with improved access to sanitation in 12 countries; provided more than 115 million liters of clean household water in five countries; and improved water governance in three countries. Regional WSSH activities included the following:

Advancing the Blue Revolution Initiative (ABRI)

ABRI helped develop a water and sanitation strategy; trained 20 USAID staff in program options to promote private financing for water utilities; and developed a training curriculum for USAID staff and partners.

Hygiene Improvement Project (HIP)

HIP worked in Ethiopia, Madagascar, and Uganda, providing 244,000 people with improved access to drinking water and 49,000 people with access to improved sanitation. HIP also reached more than 2 million people in Ethiopia and Madagascar with hygiene promotion messages and trained more than 17,000 health care and education professionals in sanitation and hygiene. HIP's goal is to reduce diarrhea in children under age 5 by building innovative partnerships to design and implement effective programs at scale in water quality improvement, household sanitation, and hygiene.

PlayPumps Global Development Alliance

PlayPumps is a $60 million public-private partnership to provide clean water in 10 countries in sub-Saharan Africa by installing 4,000 PlayPumps in schools and community locations by 2010. By the end of FY 2008, PlayPumps International had installed 1,105 PlayPump systems in South Africa, Mozambique, Swaziland, Zambia, Lesotho, and Kenya. In addition, hundreds of pumps were constructed and purchased. Administrative barriers were also cleared, which will enable PlayPumps to aggressively deploy U.S. funding support in Uganda, Malawi, Tanzania, and Ethiopia.

Sustainable Water and Sanitation for Africa (SUWASA)

Planning and program design considerations for the SUWASA program were formulated and refined. Beginning in 2009, the program will promote and implement innovative reform and finance approaches to providing water, sanitation, and hygiene services in urban, slum, and rural areas of sub-Saharan Africa. SUWASA will support up to 15 individual initiatives over four years.

Water and Development Alliance (WADA)

This alliance with the Coca-Cola Company is a strategic global public-private partnership that works to address water resources and development needs in priority countries where both USAID and Coca-Cola work. In FY 2008, 106,000 people gained improved access to drinking water, and 17,000 people gained access to improved sanitation through WADA activities. In Tanzania, the first phase of the WADA program improved access to safe drinking water, improved sanitation, and increased hygiene in two of the country's most critical river basins, reaching more than 20,000 people (primarily schoolchildren), as well as more than 150,000 people in communities that benefited from improved watershed protection. WADA provided rain catchment systems, improved sanitation infrastructure (such as ventilated improved pit toilets), and initiated and trained community water and sanitation management committees.

West Africa Water Initiative (WAWI)

WAWI was launched in 2002 to invest in potable water supply, sanitation, and hygiene activities in Ghana, Mali, and Niger as part of an integrated approach to water resources management and development. It functions as a Global Development Alliance combining the efforts and resources of the Hilton Foundation and more than 10 other partners, including USAID. Its range of activities includes water source development and rehabilitation, latrine construction, household- and school-based sanitation and hygiene education, community mobilization, hydrogeological analysis, policy development, livelihoods, small-scale irrigation, and income generation. In FY 2008, WAWI helped 11,300 people gain improved access

to drinking water and 1,900 people gain access to improved sanitation.

EAST AFRICA REGIONAL

During FY 2008, USAID funds in water and sanitation programming achieved key results in the Mara River Basin of Kenya and Tanzania, an area lacking in sewerage waste systems. Pit latrines are the only fecal disposal method available. Nearly three-quarters of the local population take one hour or more to access water during the dry season. Over-reliance on unprotected water sources and poor hygiene practices have caused unacceptably high rates of diarrhea and intestinal worms in Trans Mara and Bomet districts in Kenya. A similar situation prevails on the Tanzanian side of the basin.

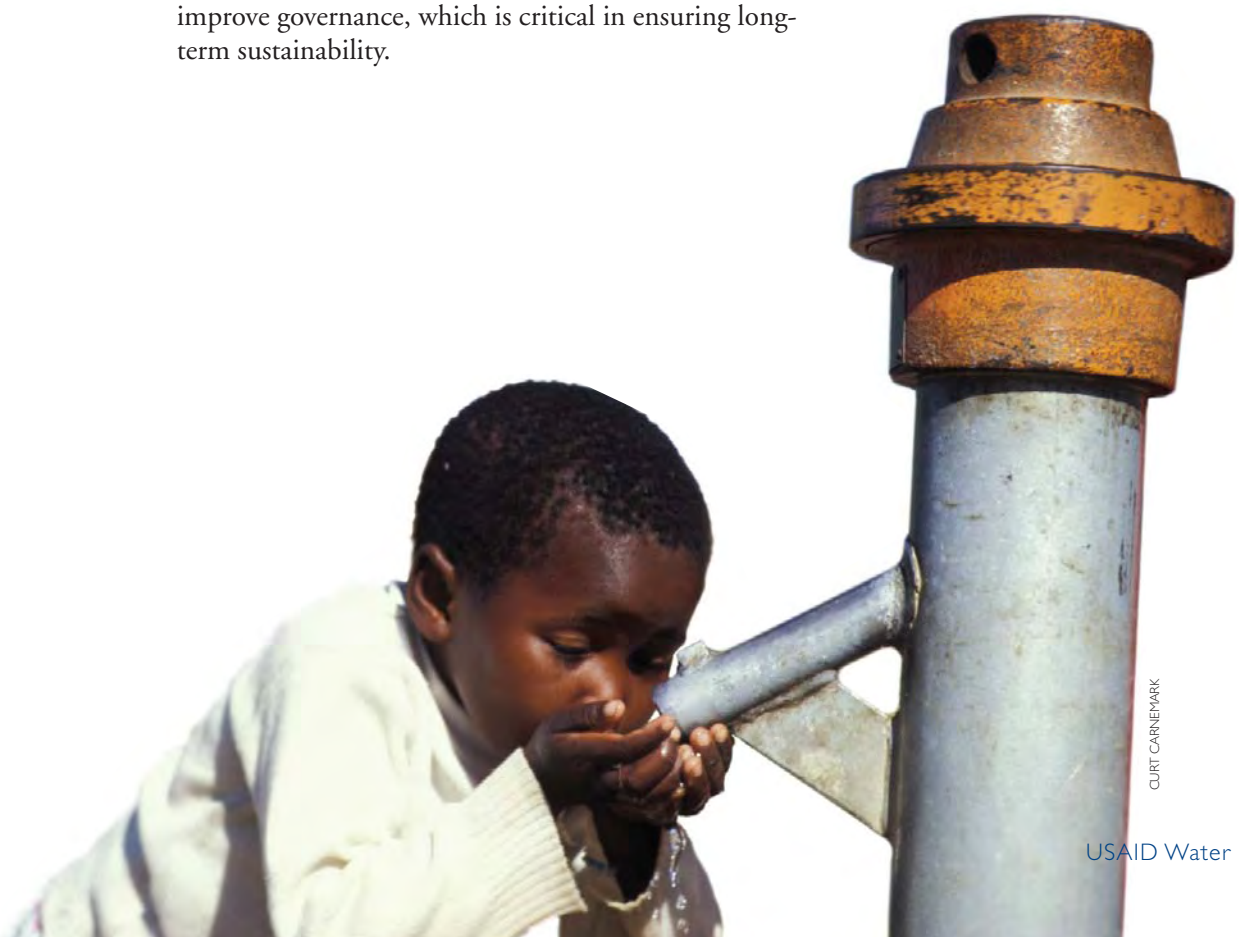
FY 2008 results included the following:

- Surveys and feasibility studies identified priority locations and appropriate technologies for new and refurbished water supply systems and sanitation facilities.
- Capacity building and hygiene training activities prepared the beneficiary communities and raised awareness of the sanitation and hygiene issues.
- Eight village saving and loan groups were formed to strengthen local water users associations (WUAs) and improve governance, which is critical in ensuring long-term sustainability.
- Rehabilitation and construction of water systems were initiated in two villages and in two schools, with about 80 percent of the work completed. The completed systems will improve access to clean drinking water for at least 3,000 people and improve sanitation facilities for another 3,000.

The program had a multifaceted training component, training local WUA members in care and maintenance of new and rehabilitated water systems and local promoters in water conservation, hygiene, and POU water treatment technologies to encourage long-term behavior change. Hygiene behavior change communication was a particular focus of training for 135 WUA members, local leaders, school teachers, and village health workers. The program also commissioned development and dissemination of appropriate information, education, and communication materials for hygiene promotion and initiated "child-to-child" school hygiene clubs.

SOUTHERN AFRICA REGIONAL

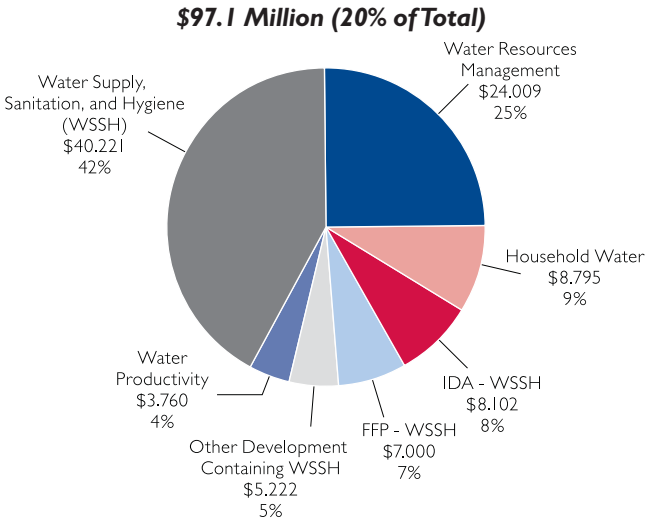
USAID provided training and technical assistance to the Okavango River Basin Commission to strengthen regional institutional capacity to design, finance, build, operate, and maintain improved water and sanitation systems, which will help Angola, Botswana, and Namibia achieve in the long term the MDGs for water and the environment.



CURT CARNEMARK

ASIA

Figure 9: Estimated USAID Water Funding Obligations by Theme, Asia, FY 2008 ($ Millions)



Afghanistan

Population	29.9 million
% population lacking access to improved drinking water supply (2006)	urban: 63
	rural: 83
% population lacking access to improved sanitation (2006)	urban: 55
	rural: 75

In 2006, Afghanistan had the world's lowest ranking of population – just 22 percent – with access to a sustainable source of clean water. To help tackle this immense problem, USAID worked with the private sector to increase access to basic health products and services for women of reproductive age and children under age 5. Specifically, the program promoted POU treatment of potable water with the chlorine-based Safe Water System (SWS) solution, sold under the local brand name Abpakon. In FY 2008, more than 212,000 units of SWS were sold, providing more than 212 million liters of clean water. SWS training was also provided to 2,144 doctors, 2,362 pharmacists, 570 CHWs, 77 NGO staff members, 299 community *shura* (councils), 10 mullahs, and 653 teachers. The project also engaged mullahs to promote SWS use during Friday prayers.

Countries Receiving USAID WSSH Assistance,

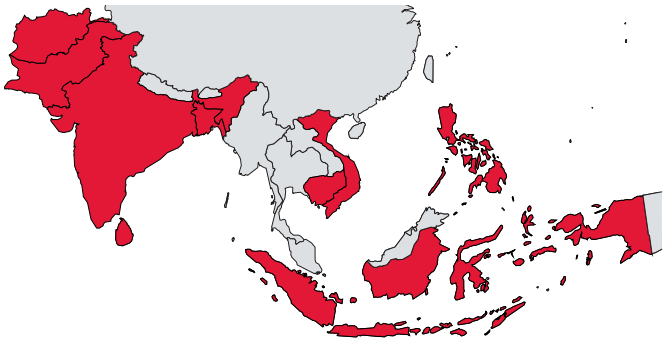


Table 6: Top Receiving Countries, WSSH Funding,* Asia, FY 2008

Receiving countries	$ (millions)	Percent
Afghanistan	14.0	20.2
Bangladesh	9.9	14.3
Indonesia	8.4	12.1
Pakistan	7.5	10.8
India	7.3	10.5
Cambodia	5.3	7.6
East Timor	3.5	5.1
Burma	2.2	3.2
Philippines	1.5	2.2
Other (5 countries, 2 Regional Missions)	9.7	14.0
Total WSSH/Asia	**69.3**	

* Estimated obligations and commitments

Bangladesh

Population	141.8 mill.
% population lacking access to improved drinking water supply (2006)	urban: 15
	rural: 22
% population lacking access to improved sanitation (2006)	urban: 52
	rural: 68

Despite flat, alluvial land, Bangladesh has varied water problems that pose significant development challenges. More than 25 percent of the rural and urban populations are still in need of improved access to safe drinking water, while 61 percent do not have access to hygienic sanitation systems. During the monsoon season, one-third of the country undergoes regular flooding, and in the dry

USAID

Water supply project, Bangalore, India.

season, a similar amount of land suffers from water scarcity for both irrigation and domestic use. In the large coastal belt, there is the additional challenge of water salinity, which destroys crops and drinking wells. Naturally occurring arsenic contamination of wells also threatens to reverse earlier success in reducing severe skin disorders and diarrhea incidence.

The Bangladesh Government is very concerned about problems in the water sector and is stepping up various initiatives to change policies and regulations for better management. Most of USAID's water programs contribute significantly to the goals of increased access to drinking water and sanitation in the Government's Poverty Reduction Strategy, and the Government is very receptive to USAID's programs in these areas.

In FY 2008, U.S. Government-supported water activities focused on improving drinking water, sanitation, and disaster preparedness. USAID provided safe drinking water for more than 343,000 people, or 80 percent of the target of 428,750 people, and access to hygienic sanitation for more than 265,500 people (60 percent) of the target of 440,025 people. The primary reason for not meeting the targets was Cyclone Sidr, which in November 2007 made direct landfall on one of USAID's water and sanitation program areas and resulted in a suspension of all planned activities as USAID and its partners focused on emergency response. The cyclone caused significant destruction of water points and sanitary latrines. In one program area, sanitation coverage worsened from 34 percent to less than 15 percent following the cyclone. USAID's partners suspended planned activities for 90 days and instead provided emergency water and sanitation services to around 1.3 million people in some of the heavily impacted areas.

Using Food for Peace Program resources, U.S. assistance programs also installed deep tube wells and piped water options, constructed latrines, provided education about arsenic in drinking water sources, and provided formal awareness-raising sessions on hygienic sanitation. The latter activity used trained community health volunteers to conduct twice monthly household-level courtyard sessions and brought significant changes to community water and sanitation practices. For example, partners report that community members have stopped using crop fields for sanitation needs. Many elected representatives have declared using fields to be against community law, and violators are subject to fines or censure if they use crop fields rather than latrines.

Even though FY 2008 targets were not met, cumulative achievements are close to the life-of-activity targets. Expected achievements through 2009 in water quality and sanitation should contribute significantly to the achievement of the MDGs calling for 50 percent coverage in safe water and hygienic sanitation facilities by the year 2015.

India *(map and data page 28)*

India's growing population and expanding economy has generated increased demand for basic infrastructure, particularly water and sanitation services in urban areas. Investments, unfortunately, have failed to keep pace with the demand for improved urban water and sanitation services. The USAID assistance program addresses the key constraints that impact the delivery of services – an inadequate resource base for urban local bodies, an inability to access market-based capital financing, and poor capacity to formulate, structure, implement, and main-

WSSH SUCCESS STORY – INDIA

POUZN Project Expands POU Water Disinfection in India

SUKHMINDER DOSANJH

Above: Community information session on POU water disinfection.

Below: Public testing of water for contamination.

GPN GROUP,AED

In 2008, USAID's Point-of-Use Water Disinfection and Zinc Treatment (POUZN) project, managed by the Academy for Educational Development (AED), implemented an operations research model to change drinking water behavior among lower-income families in India's Uttar Pradesh state. Nearly 500,000 Indian children under age 5 die annually due to diarrhea caused by drinking polluted water, and 25 percent of these deaths are in Uttar Pradesh, India's most populous – and one of its most impoverished – states. In its first phase, POUZN reached 60,000 poor households and converted nearly 80 percent of households into users of point-of-use (POU) water disinfection products and systems. Through partnerships with self-help groups (SHGs) that help members gain microfinancing and access to services, products, and information, POUZN increased POU use from 4.25 percent to 79.2 percent (96 percent of 1,525 urban households and 77 percent of 10,023 rural families). The project provided more than 9.6 million liters of treated water in 10 months.

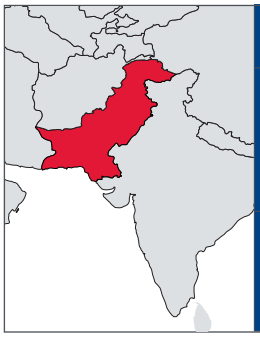
POUZN also undertook an innovative water testing exercise among rural SHG members. Water samples were obtained from water sources and from homes. Publicly testing the water demonstrated the possibility of recontamination – even for water that is pure at its source – and provided community members with a visual test of contamination. POUZN also established partnerships between commercial POU product manufacturers and NGOs; trained NGO staff on water purification; encouraged the NGOs to work with manufacturers; and provided choices in POU products, including chlorine, water filters, and information on boiling and solar disinfection. These steps significantly increased the size of the population using a POU method, with some options costing as little as 25 cents per month. The commercial partners who extended credit for filter purchases recovered all of their loans. POUZN also negotiated and implemented distribution commissions for NGO partners from manufacturers to help sustain the relationship beyond the project life.

In its second phase expansion, POUZN expects to reach 600,000 residents in 930 rural poor villages and 520,000 in 480 urban slums to create new users of POU water treatment products and systems. POUZN expects to avert up to half of diarrhea episodes in Uttar Pradesh households that regularly treat their water and will also continue to track SHG members to see if long-term behavior change occurs.

Launched in 2005, the POUZN project also mitigates the impact of diarrheal illness by promoting treatment of diarrhea with zinc therapy.

tain urban infrastructure projects. Water and sanitation services for urban dwellers are being improved through management reform, performance incentives at the state level, and technical capacity building. In FY 2008, USAID assistance focused on project development, resource mobilization and enhanced investment in urban infrastructure, and led to an increase in the number of people receiving improved drinking water and sanitation facilities. Nearly 137,000 people achieved access to improved potable water, and more than 398,000 people increased their access to improved sanitation facilities. The program's capacity building efforts succeeded in increasing source revenue by more than $629.3 million in 14 municipalities, and helped six municipalities invest more

Population	1.1 billion
% population lacking access to improved drinking water supply (2006)	urban: 4
	rural: 14
% population lacking access to improved sanitation (2006)	urban: 48
	rural: 82



Population	157.9 million
% population lacking access to improved drinking water supply (2006)	urban: 5
	rural: 13
% population lacking access to improved sanitation (2006)	urban: 10
	rural: 60

than $64.3 million in critical water and sanitation projects. In Orissa and Madhya Pradesh states, USAID's Financial Institutions Reform and Expansion-Debt (FIRE-D) project continued testing two sustainable models for providing affordable and equitable access to safe drinking water and sanitation. In Orissa, FIRE-D provided technical assistance, training, and capacity building to the state-level water utility to help corporatize and restructure operations, institute operating and financing reforms, and move toward full cost recovery in order to allow it to expand services to all urban residents, including the poor. FIRE-D was responsible for a public-private partnership to provide individual water supply and sanitary toilets in seven slums in Bhubaneswar municipality that will benefit approximately 3,500 people. As part of the project, FIRE-D is also providing technical assistance for formulating a comprehensive upgrading strategy for all of Bhubaneswar's 377 low-income settlements with a focus on how water and sanitation are linked to improved health and hygiene. In Madhya Pradesh, FIRE-D supported the state government in developing an urban infrastructure fund that will plan and prepare water and sanitation projects financed through municipal bonds and other sources of private sector capital. FIRE-D plans for at least one citywide water and sanitation project serving a population of 150,000 to 200,000 people that will help ensure the new projects benefit the poor and that potential linkages with health and hygiene resources are assessed.

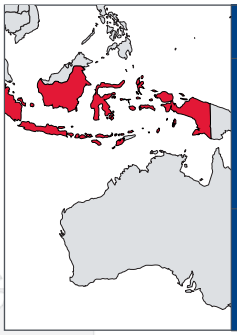
Pakistan *(map and data next column)*
Safe drinking water is not readily available in Pakistan. While coverage statistics are high, the quality of supplied drinking water is low. In 2008, USAID worked with the Government to improve management of water and sanitation services, water supply administration and distribution, and billing and collections, thereby boosting revenues and enabling local governments to undertake needed maintenance, manage more effectively and efficiently, and expand services to more citizens. By the end of 2008, USAID/Pakistan's water and sanitation programs had trained more than 200 government, NGO, and community staff in operating and maintaining water filtration units. More than 1,000 water quality tests were conducted on drinking water sources. The project mapped and investigated 554 public drinking water sources and performed water quality tests in the Federally Administered Tribal Areas (FATAs).

Because poor access to clean drinking water and sanitation in schools is one of the reasons for low enrollment and high primary school dropout rates among girls, providing or rehabilitating latrines in 190 schools and installing hand pumps in 90 FATA villages – benefiting more than 6,000 households – helped increase girls' school attendance in the region. USAID programs trained 880 members of parent-teachers associations in better health and hygiene practices and instructed 360 female teachers in the child-to-child approach to hygiene education.

Across the nation, USAID supports the Pakistan Safe Drinking Water and Hygiene Promotion Project, which operates in 28 districts, six FATAs, and six Frontier Regions. The program directly benefits approximately 3 million people, and reaches an estimated 32 million people with public communications campaigns. By the end of 2008, the project reached more than 340,000 people in rural areas with safe drinking water and hygiene promotion messages. More than 5,500 hygiene promoters were mobilized, including doctors, religious leaders, and water filtration plant operators. Nationwide relays of 44,000 radio messages reach an estimated 31 million people. More than 1,600 women volunteers completed orientation to spread hygiene messages in their wider communities, and 23,000 teachers received hygiene training and then conducted safe hygiene activities with 280,000 primary school students. These students are expected to carry the messages home, bringing the information to about 2.2 million people.

Indonesia

Water Supply, Sanitation, and Hygiene



Population	222.8 million
% population lacking access to improved drinking water supply (2006)	0.323
	rural: 29
% population lacking access to improved sanitation (2006)	urban: 33
	rural: 63

USAID/VIRGINIA L.FOLEY

In north Jakarta, a Muslim prayer group leader demonstrates how to add "blessed water" treatment solution to household water.

More than 100 million people in Indonesia lack access to safe drinking water. Even in places where water is piped into homes, it is not necessarily safe. Indonesian women know that to protect their children from diarrhea, the second leading cause of death among Indonesian children under age 5, they must find safe water. They boil contaminated water or buy bottled water. Gathering enough fuel for boiling can take half a day, and kerosene for gas stoves is expensive.

In 2008, USAID worked with NGOs, community groups, schools, and all levels of the Government to support activities to increase access to safe water, including a public-private partnership to promote an affordable, practical, user-friendly water treatment technology called Air RahMat ("Blessed Water"). A few drops of this lifesaving 1.25 percent sodium hypochlorite solution make water safe to drink, and one bottle can meet the needs of a family of five for a month. Clinical studies show that the solution, which was developed by the U.S. Centers for Disease Control, can reduce the incidence of diarrheal diseases by 85 percent. USAID is supporting the product's production, distribution, promotion, and marketing in Indonesia. Through this partnership, more than 75 million liters of drinking water were treated with Air RahMat in FY 2008.

USAID also worked with the Ministry of Health (MOH) to develop the Household Water Treatment and Safe Storage (HWTS) Policy. HWTS is now included in the national Community-Based Total Sanitation Strategy, a broad plan that incorporates the five pillars of diarrhea reduction – stopping open defecation, handwashing with soap, HWTS, household waste water management, and household solid waste management. Institutionalizing HWTS at the national level accelerated the dissemination and uptake of HWTS technologies, including Air RahMat. Two years ago, boiling water was the only MOH- endorsed technology for safe drinking water. Today, four technologies are accepted: chlorination, filtration, solar disinfection, and boiling. Indonesia is one of the first countries to establish an HWTS policy and develop an integrated hygiene strategy.

USAID/Indonesia's Environmental Services Program (ESP) collaborated with local and national stakeholders to build a foundation for sustainable access to improved safe water and sanitation facilities. Nearly 1 million people gained improved access to safe water, and 25,000 people gained improved access to sanitation facilities in 2008 as a result of this program. These household connections enabled poor families to pay five to 10 times less for safe water. The number of households adopting adequate health and hygiene practices – the precursors to reducing childhood diarrhea – increased by 15.7 percent in program areas. In addition, almost 400,000 people gained access to clean water through USAID's Water-for-the-Poor approaches, which include communal water metering and microcredit schemes. More than $18 million was leveraged from government agencies and other donors for continuing Water-for-the-Poor activities.

To promote handwashing with soap, USAID's Health Services Program (HSP) helped develop communication modules that the national Health Promotion Unit used to train 420 volunteers and village leaders from 130 villages. More than 40 schools in Aceh integrated handwashing with soap into their curricula. In coordination with ESP, the MOH, the Safe Water System program, and corporate sponsors, HSP also cohosted several large events in 2008, highlighting handwashing with soap that reached more than 10,000 students and journalists from Indonesia's top news media.

WSSH SUCCESS STORY – PHILIPPINES

Underground Facility Treats Wastewater So It Is Safe to Reuse

MUNTINLUPA CITY PIO

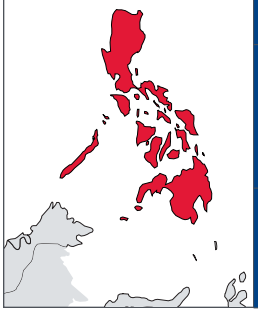
Stall owners at the Muntinlupa Market are pleased that vendors and customers now have a cleaner market thanks to an underground wastewater treatment plant designed with USAID assistance.

Years ago, the Muntinlupa Market was a muddy, messy public market with acrid odors created by 1,235 stalls selling everything from meat and fish to vegetables. The market's eateries, toilets, and stalls generated wastewater that polluted a tributary creek of Laguna Lake, one of the most vital inland bodies of water in the Philippines and a source of drinking water and freshwater fish for Metro Manila. To avoid further polluting the lake, Muntinlupa's city government invested in an underground wastewater treatment system. USAID helped the city design a low-cost, low-maintenance model facility, the first of its kind in the Philippines. The system uses grit screens, septic tanks, and an anaerobic-baffled reactor (an upgraded version of a septic tank) to reduce the pollution level of the wastewater. Crushed glass and coco peat were tested as low-cost filters for the final stage of the treatment process. Coco peat, a waste product of the coconut processing industry, is widely available and proved to be very effective in removing pollutants. The treated water is safe to use for flushing toilets, street cleaning, and watering plants. In addition, a reinforced cement parking lot and loading dock cover the underground treatment facility, thus keeping it out of the way of an already crowded market complex. The innovative treatment plant at Muntinlupa costs one-third less than a conventional plant to build and less than half to operate and maintain. The use of recycled water also saves the city in monthly water bills. USAID is helping five other cities in the Philippines build these highly successful, efficient, and ecologically friendly public market treatment plants. In all, 44,000 people should gain improved access to sanitation facilities through USAID's support for new or improved wastewater treatment systems.

Three private sector partnerships furthered water and sanitation objectives by developing sustainable market-based approaches to improving sanitation practices among target populations:

- Unilever provided soap to complement USAID handwashing education activities.
- Medentech provided 20 million Aquatab POU water purification treatments, which remove much of the bacteria and other harmful matter in unclean water.
- The Mobilink mobile communications network sponsored free distribution of educational and promotional messages on the phone cell network.

Philippines *(map and data next column)*
Lack of access to clean water in the Philippines has tremendous health and economic impacts. Estimates



Population	83.0 million
% population lacking access to improved drinking water supply (2006)	urban: 4
	rural: 12
% population lacking access to improved sanitation (2006)	urban: 19
	rural: 28

showed that in the Philippines, there are about 38 million diarrhea cases annually that cause the deaths of thousands of children each year. This, plus environmental damages from untreated sewage, costs the economy more than $1.6 billion a year.

In FY 2008, combined USAID efforts contributed to improving access to water supply and sanitation for nearly 340,000 people in target areas, bringing the number of

people gaining access to improved drinking water supply since FY 2006 to almost 870,000 and to sanitation facilities to nearly 243,000. USAID funds supported the construction of community water systems benefiting more than 19,000 people with improved access to drinking water supply in conflict-affected areas in Mindanao, including remote villages.

USAID's efforts to bring in private financing for the water sector leveraged at least $16.5 million of private funds for seven water supply projects. Private banks, including the Bank of the Philippines Islands, Allied Bank, and Metro Bank, provided loans to seven water districts to expand current water coverage for at least 275,000 new customers over the coming six to 10 years, with USAID's Development Credit Authority and the LGU Guarantee Corporation providing partial credit guarantees. USAID's technical assistance to the Philippine Government in implementing financing reforms in the water sector generated growing interest among private banks to finance water projects traditionally funded by official development assistance and public funds. In collaboration with other donors, USAID also supported consultations with stakeholders in the water sector to map out steps to strengthen regulation of the water sector and improve the performance of water utilities, which is deemed to create more demand for financing and thus improve water service coverage.

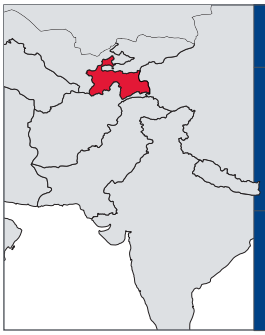
To improve household sanitation systems in target sites, USAID assistance included the following efforts:

- Developing a partnership among real estate developers, the local government, and the U.S. Naval Construction Regiment to build a wastewater treatment system for a low-cost housing project in Calbayog City that will improve access to sanitation for at least 240 families (1,440 individuals)
- Mobilizing resources from eight local governments to invest in various wastewater treatment facilities for government-controlled enterprises such as public markets and slaughterhouses
- Supporting strong collaboration with the local government in Sarangani province to ensure that a septage treatment facility, funded by the Japan Bank for International Cooperation and providing more than 21,000 people with improved access to sanitation, will be sustained through proper operation and maintenance and charging of users fees
- Partnering with the Petron Foundation to improve sanitation facilities in schools in Mindanao, with more than 700 schoolchildren benefiting

In addition to improving sanitation infrastructure, USAID also supported hygiene promotion activities to raise awareness on the importance of proper handwashing in reducing waterborne diseases.

The end of FY 2008 saw the long-awaited launch of the U.S./Japan-led Philippine Water Revolving Fund (PWRF). The Philippine, Japanese, and U.S. Governments jointly hosted the event on October 20 at the Development Bank of the Philippines (DBP). Witnessing the launch were potential borrowers from various water utilities, interested lenders from different private financing institutions, and representatives of donor agencies supporting the water sector. The PWRF is an innovative lending program to help the Philippine Government stimulate private financing for water infrastructure to help the country achieve its MDGs in water and sanitation. Water infrastructure in the Philippines (outside of Metro Manila) has been previously funded almost exclusively by public and donor resources. The PWRF seeks to leverage private funds through a cofinancing scheme between DBP (with funds provided by the Japan International Cooperation Agency) and private banks, whose loans will be partially guaranteed through USAID's Development Credit Authority. During the coming three years, the PWRF hopes to benefit up to 1.4 million Filipinos through loans to water utilities throughout the country. The PWRF is established under the bilateral U.S.-Japan Clean Water for People Initiative, which aims to help countries such as the Philippines achieve their water and sanitation MDGs.

Tajikistan



Population	7.0 million
% population lacking access to improved drinking water supply (2006)	urban: 7
	rural: 47
% population lacking access to improved sanitation (2006)	urban: 5
	rural: 9

USAID's Local Governance and Citizen Participation Project helped more than 20 local governments repair and improve their drinking water supply systems. In addition to installing new high-capacity pumps, improving


USAID

A young girl in Tajikistan enjoys access to clean, potable water.

wells, and repairing leaking pipes, the project trained personnel to maintain and repair the water systems. The project also worked with local officials to inform residents through citizen participation activities and conducted public education on water conservation methods and health and hygiene, all to ensure the sustainability and positive impacts of the project.

REGIONAL DEVELOPMENT MISSION/ASIA (RDMA)

More than 80 million people in Asian cities lack access to safe drinking water, and more than 250 million lack access to basic sanitation. As Asia's urban population increases to an estimated 2.6 billion by 2030, water services providers are ill equipped to meet the growing demand. While poor households face a disproportionate impact from inadequate access to water services, women and girls suffer the greatest burden, due to their responsibilities to collect water and care for the sick, which reduce time for education or other empowering activities.

USAID's Regional Development Mission/Asia (RDMA) implements water supply, sanitation, and hygiene activities under the Paul Simon Water for the Poor Act, promoting the achievement of water- and sanitation-related Millennium Development Goals and disseminating and replicating the results through regional networks. Primarily through USAID's Environmental Cooperation-Asia (ECO-Asia) project, in FY 2008, RDMA continued to increase access to reliable and sustainable water and sanitation services to support regional health, security, and prosperity in Asia. Principal accomplishments included:

- Bringing continuous water supply to 64,000 residents in Badlapur, India
- Improving sanitation for 170,000 residents of Marikina, Philippines, through septage management
- Connecting 700 residents in Negombo, Sri Lanka, through an innovative community-based small piped distribution network
- Developing and applying an innovative toolkit for promoting improved water and sanitation services through water, sanitation, and hygiene (WASH) promotion campaigns in Phnom Penh, Cambodia
- Developing a water and sanitation action agenda for ASEAN through consultations with 19 cities
- Establishing WaterLinks as a new regional network to facilitate regional utility twinning

ECO-Asia

Many water and wastewater utilities in Asian cities struggle to provide adequate services for residents due to technical, institutional, and financial challenges. Since 2007, ECO-Asia has been helping urban utilities expand or improve services by fostering utility-to-utility "twinning" partnerships that facilitate the adoption of best practices. Under the ECO-Asia Water and Sanitation Program, RDMA pilots and replicates innovative strategies for expanding and sustaining access to services, especially to the urban poor, through partnership with cities, water utilities, and financing institutions. Key programming areas include: 1) enabling safe water access; 2) promoting sustainable sanitation; 3) strengthening water services utility performance; and 4) innovative financing. In 2008, ECO-Asia expanded its twinning program with 10 new partnerships and worked to improve access to safe water and sustainable sanitation services in cities in Cam-

MIKE ROBERTS, IDE-CAMBODIA

Water filtration pots, Cambodia.

bodia, China, India, the Philippines, Sri Lanka, and Vietnam. These projects typically entailed such activities as connecting the urban poor to water supply, reducing water loss, improving water quality, ensuring continuous water supply, promoting customer relations, and improving wastewater services delivery.

Cambodia: RDMA developed an innovative toolkit for cities to develop the tools and capabilities to promote improved water and sanitation services. In applying the toolkit, RDMA worked with the city of Phnom Penh to

Population	14.0 million
% population lacking access to improved drinking water supply (2006)	urban: 20
	rural: 39
% population lacking access to improved sanitation (2006)	urban: 38
	rural: 81

organize and implement its first water, sanitation, and hygiene promotion campaign to raise awareness of good hygiene practices and encourage decisionmakers to invest in improved sanitation throughout the municipality and the country. The WaterSHED program, awarded in 2009, will carry forward and expand on previous activities in Cambodia to increase access to safe water technologies and extend them to Laos and Vietnam as well.

China: In China, transparent and accountable governance is critical to strengthening water and sanitation services. Recent large-scale water pollution incidents and the increasing number of private sector acquisitions of water systems at undisclosed terms underline the critical importance of government transparency and accountability. RDMA launched ECO-Asia's Water and Sanitation activity in China in FY 2008 with a focus on demonstrating and replicating best practices for improving and expanding the delivery of water and sanitation services in key urban centers through improved governance systems.

India: Thanks to an RDMA/ECO-Asia program in Badlapur, a city of 160,000 near Mumbai, 64,000 residents gained first-time access to continuous water supply. Badlapur's urban poor live in overcrowded slums. While most have household water connections, until recently they received water for only four hours a day. The state water provider, Maharashtra Jeevan Pradhikaran (MJP), was attempting to increase the hours of water supply but needed technical help to eliminate water losses and improve system efficiency. ECO-Asia arranged a twinning partnership between MJP and Ranhill Utilities Berhad, a Malaysian utility with significant experience in improving system efficiencies to sustain full-time service. With facilitation assistance from USAID, Ranhill began providing technical guidance and hands-on training for MJP engineers and plant operators on managing continuous water supply zones, or district metering areas (DMAs). Ranhill conducted water treatment process audits and recommended ways to optimize treatment operations, eliminate water losses, ensure safe water quality, and upgrade plants to accommodate future increases in demand. By creating DMAs and controlling water loss, MJP brought the benefits of continuous water supply to eight of Badlapur's 34 wards.

MJP is now investing in upgrades at treatment plants, replacing equipment, and improving DMA design in eight wards. It plans to continue this pioneering effort by bringing continuous supply to the city's remaining wards, ultimately benefiting all 160,000 residents. The utility also plans to replicate the continuous service model in 25 other cities throughout Maharashtra state. Uninterrupted

AECOM INTERNATIONAL DEVELOPMENT

When asked about the new continuous water supply, a longtime resident of Badlapur, India, responded, "Badlapur has changed!"

supply also yields other benefits, such as improved health and productivity.

Philippines: In the Philippines, more than 55 people are estimated to die each day from waterborne diseases, and groundwater contaminated by poorly treated or untreated human waste is a major cause of these diseases. While 80 percent of the urban population has access to improved sanitation (primarily septic tanks), only 3 percent of urban dwellers in the Philippines are connected to sewers, according to a recent USAID study. Most on-site septic tanks are only desludged when they overflow, and the resulting septage is often dumped without treatment, leading to public health risks and environmental damage. To address such urban sanitation problems in the city of Marikina, an ECO-Asia project worked with local government and the Manila Water Company to improve access to sanitation for more than 170,000 residents through improved septage management, infrastructure development, and citizen awareness. In the Marikina project, the city passed a septage management ordinance requiring proper septic tank design and desludging of all septic tanks once every three to seven years. To promote sewage treatment, USAID facilitated cooperation between Marikina and Manila Water, which will build an interceptor collection system and three wastewater treatment plants along the Marikina River, the first system of its kind in the country. USAID also raised awareness of good sanitation by training community leaders in community education and hygiene promotion, including organizing water, sanitation and hygiene (WASH) days. As a result of the activity, Manila Water now operates four trucks cleaning 92,000 Marikina septic tanks once every five years. By January 1, 2008, 11,000 septic tanks had been desludged, benefiting more than 55,000 people. In 2009, Manila Water plans to spend $57.8 million for the new treatment plants, which will benefit more than 600,000 residents. USAID is using the Marikina experience as a model for other cities in the Philippines and throughout the region.

To help local water districts extend piped water to poor urban neighborhoods, another ECO-Asia project in the Philippines helped the Local Water Utilities Administration (LWUA) develop the Project Development and Efficiency Improvement Fund (PDEIF), an innovative financial product that offers less creditworthy water districts short-term loans to upgrade their operational efficiency and ability to repay. These upgrades improve the districts' financial and operational performance. Moreover, districts with an improved financial position become eligible for new loans to expand their infrastructure network.

LWUA issued its first PDEIF loan (US$200,000) to the Laguna water district in southeast Metro Manila, which led to improved access to piped water for 10,800 residents. The district put up $200,000 of its own money to match the loan and used the funding to finance efficiency improvements and establish 3,000 new house connections. The Philippine Government gave the program a vote of confidence by injecting US$3 million into the fund. The program grew rapidly, and 10 other districts were added to the short list to receive funding. In sum, USAID helped LWUA create a new loan product that allows riskier utilities to climb up the creditworthiness ladder. This success will mean improved water access for many Philippine communities.

Vietnam (map and data on page 36): ECO-Asia engaged in two activities in Bac Ninh province. In one, the Bac Ninh Water Supply and Sewerage Company (WSSC) extended its coverage area to three new towns where consumers were not aware of the company's services and were accustomed to getting water from wells and rain collection. Because of nearby septic tanks, their water was likely to be contaminated.

WSSH SUCCESS STORY – ECO-ASIA SRI LANKA

Lessons Learned in Water Distribution, Septage Management

AECOM INTERNATIONAL DEVELOPMENT (LUKE DUGGLEBY)

Residents in Dupatah, an urban community in Negombo, used to collect water from a public standpipe. The standpipe supplied water for only two hours each day.

Connecting the urban poor to piped water remains a significant challenge for national and municipal decisionmakers in Sri Lanka. Until recently, Dupatah, an urban community of about 400 people in Negombo, relied on a public standpipe. USAID's ECO-Asia Water and Sanitation Program worked with local and national authorities to supply piped water to Dupatah through a "master meter scheme," in which a bulk meter and small piped distribution network replace the public standpipe. A community organization manages the pipe network between households and the water authority; helps maintain the water distribution network; and arranges more flexible payment options for users. Encouraged by the success of the pilot, water authorities are replicating this approach in other parts of Sri Lanka. According to Negombo's mayor, "We can now invest our own funds for implementation of similar master meter schemes in other poor settlements in Negombo."

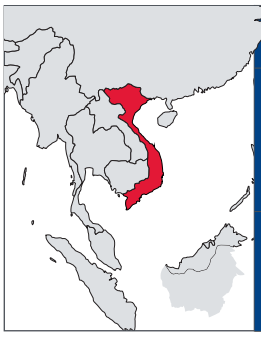
Through a twinning partnership with Marikina City, a part of Metro Manila, Philippines, ECO-Asia also applied "lessons learned" in septage management in the community of Nuwara Eliya to help it face its sanitation challenges. These included clogged and overflowing septic tanks, resulting in untreated sewage flowing in open sewer channels within densely populated subdivisions and into community waterways. Wastewater was also seeping into the ground and polluting sources of drinking water. The community needed sewage management systems it could afford and implement quickly.

Population	19.9 million
% population lacking access to improved drinking water supply (2006)	urban: 2
	rural: 21
% population lacking access to improved sanitation (2006)	urban: 11
	rural: 14

USAID conducted a prefeasibility study in Mahinda Mawatha subdivision, one of Nuwara Eliya's most densely populated communities and a pollution "hot spot." The study identified potential wastewater collection and treatment methods, focusing on approaches that were less costly to construct and easy to operate and maintain, leaving the final choice to the Municipal Council. The Council decided to invest in a decentralized collection and treatment system at an open meeting, where many community groups urged its adoption. Based on USAID's recommendations, the Council presented a funding request to Sri Lanka's Local Loan Development Facility, which approved the request for funds to design and construct the new system for Mahinda Mawatha and also committed to provide detailed engineering designs for the new system. A basic manual on septage management was created and further developed with support from Sri Lanka's Central Environmental Authority. The manual outlines the key steps of effective septage management, with particular focus on septic tank maintenance, desludging, and the use of vacuum trucks for collecting and transporting septage for safe disposal. Within a short time, city trucks employed new and improved solutions for pumping out long-clogged septic tanks and transporting the sludge for treatment. The Municipal Council is applying the pilot study recommendations as it addresses similar problems in its other subdivisions. Showcasing this experience, Nuwara Eliya and Marikina City later led a national workshop, sponsored by USAID and the Environmental Authority, and introduced more than 25 local authorities to best practices in septage management. Lessons learned in Nuwara Eliya can now be applied throughout Sri Lanka.

AECOM INTERNATIONAL DEVELOPMENT

Technicians in Bac Ninh, Vietnam, test a water meter as part of a program to reduce water losses and improve water utility operations.



Population	84.2 million
% population lacking access to improved drinking water supply (2006)	urban: 2
	rural: 10
% population lacking access to improved sanitation (2006)	urban: 12
	rural: 44

When WSSC needed help in determining demand for piped water and improving its customer outreach, ECO-Asia supported a pilot activity in the town of Thua that evaluated customer demand and improved outreach capabilities. Through a twinning arrangement, Ranhill Utilities Berhad of Malaysia trained Bac Ninh staff in customer service best practices. The pilot resulted in new service for more than 1,000 customers, representing a 25 percent increase in just six months. Additional subscribers continued to join. Bac Ninh is now using the Ranhill best practices and policies to replicate the Thua success in two other towns. Based on this partnership, every new Bac Ninh subscriber contract includes a charter to help build customer confidence in the water service and emphasize Bac Ninh's commitment to maintaining quality throughout its service area.

In the second activity, the partnership between Ranhill and WSSC helped build Bac Ninh's capacity to reduce water losses and thereby improve its water service delivery. Ranhill provided training on understanding water losses, water audits, detecting leaks, and identifying options for reducing water losses. One key recommendation was to pilot-test a district meter area, which enables more effective and accurate data analyses on zones within the distribution network. The twinning partnership created positive reforms in Bac Ninh's operations. WSSC installed a new production meter at the treatment plant, repaired faulty customer meters, eliminated unauthorized connections, and established a team to monitor and reduce water losses. Since the partnership began in 2007, water losses in the pilot area have decreased from 70 percent of the water supply to 40 percent, allowing the utility to increase the efficiency of its services. The pilot area now has better water pressure, flow, and quality. Bac Ninh is now working toward applying Ranhill's district metering methodology to reach all 121,000 customers in its service area.

ASEAN: The Association of Southeast Asian Nations (ASEAN) has emerged as a key ECO-Asia partner by supporting replication and dissemination of water and sanitation best practices. Cities in ASEAN countries face challenges involving inadequate sewerage and drainage infrastructure, water supply shortages, and limited access to safe water supply and sanitation. In FY 2008, RDMA partnered with ASEAN in the Environmentally Sustainable Cities (ESC) initiative by facilitating three twinning partnerships, in consultation with 19 cities, in support of improved water and sanitation services. USAID and ASEAN worked with the 19 cities to develop a strategy to implement the ESC Clean Water Framework, which includes raising citizen awareness of water supply and sanitation and promoting good governance. The strategy facilitated city-to-city twinning partnerships and transfer of information, best practices, and expertise. For example, Iloilo City in the Philippines is sharing its experience with Phnom Penh, Cambodia, on innovative strategies for raising the awareness of residents about improved sanitation services. In Halong, Vietnam, USAID linked the Halong Urban Environmental Company with Indah Water Konsortium, a Malaysian utility, to strengthen Halong's capacity for effectively operating its wastewater treatment plants.

WaterLinks: In partnership with the Asian Development Bank (ADB) and the International Water Association

AECOM INTERNATIONAL DEVELOPMENT (JAY TECSON)

WASH day campaigns – such as this one in the city of Marikina, Philippines – and similar efforts promote sanitation and hygiene, resulting in more willingness to pay for sanitation services.

(IWA), USAID established WaterLinks as a new regional network for facilitating regional utility twinning, capacity building, and knowledge sharing among water operator partnerships. Launched with the signing of a memorandum of understanding on August 19, WaterLinks serves as the regional network for Asia for the Global Water Operator Partnership Alliance, led by UN-HABITAT. Its objectives are to:

- Broker and facilitate twinning partnerships
- Strengthen utility capacity through regional training and toolkits
- Disseminate best practices via publications, events, and the WaterLinks Web site (www.waterlinks.org)

Each development partner supporting WaterLinks contributes resources in line with its comparative advantages. USAID, through its ECO-Asia project, develops and facilitates partnerships, strengthens regional capacity, and manages the WaterLinks knowledge hub. ADB supports regional capacity building initiatives and coordinates with USAID on jointly facilitating selected twinning partnerships. IWA supports knowledge sharing and outreach and helps promote the establishment of new partnerships through its member networks.

MIDDLE EAST

Figure 10: Estimated USAID Water Funding Obligations by Theme, Middle East, FY 2008 ($ Millions)

$107 Million (22% of Total)

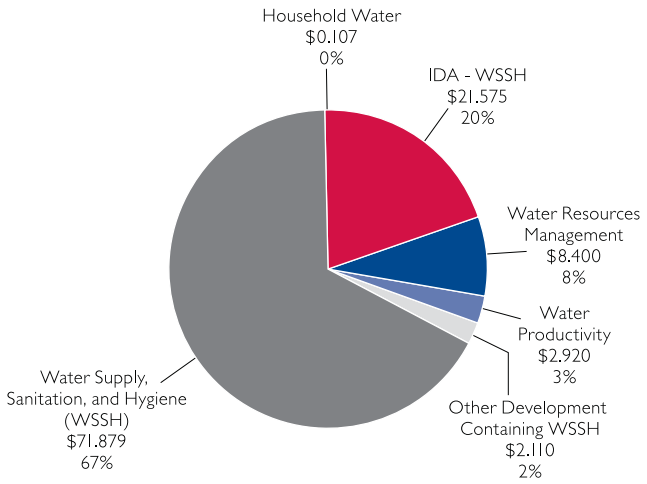


Table 7: Top Receiving Countries, WSSH Funding,* Middle East, FY 2008

Receiving countries	$ (millions)	Percent
Jordan	41.7	43.6
Iraq	21.6	22.6
West Bank/Gaza	19.2	20.0
Lebanon	8.0	8.4
Egypt	1.4	1.5
Other (1 Regional Mission)	3.8	4.0
Total WSSH/Middle East	**95.7**	

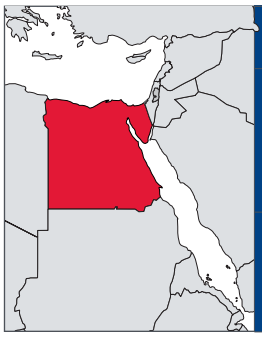
* Estimated obligations and commitments

Egypt *(map and data next page)*

The Egyptian Government reports spending more than $11 billion on water and sanitation infrastructure over the last 25 years, while USAID invested approximately $2.8 billion over the same period. Even after these significant investments, however, many Egyptians continue to suffer from inadequate access to reliable and quality water and sanitation services, to the severe detriment of public health.

USAID

Collecting water, Egypt.



Population	74.0 million
% population lacking access to improved drinking water supply (2006)	urban: 1
	rural: 2
% population lacking access to improved sanitation (2006)	urban: 15
	rural: 48

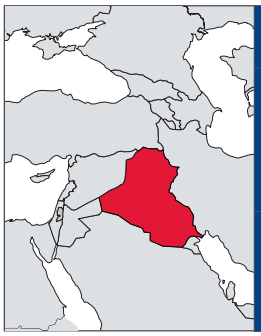
Although nearly 100 percent of Egyptians reportedly receive government-provided water, services are not reliable, and water quality often does not meet basic health standards. On the sanitation side, nearly all residents of Egypt's 217 cities were connected to sanitation services by the end of 2007, but many residents of the country's 4,617 towns and 27,000 villages had limited or no access to these services. For example, only 11 percent of villages were connected to wastewater treatment plants.

To help the Government improve water and sanitation services, in 2008, USAID contributed $1.3 million from water earmark funds to the Egypt Utilities Management (EUM) Program. Through EUM, USAID/Egypt continued its support of policy reforms in the water and wastewater sector, with the goals of achieving technical and financial sustainability and improving operations and management. Specifically, with USAID assistance, the Government set goals to 1) achieve financial viability; 2) develop performance indicators and monitoring systems; 3) convert public utilities into properly functioning companies; 4) develop organization structure and compensation plans; 5) conduct tariff analyses; 6) implement new rural water and wastewater activities; and 7) provide training. With the Government showing a high level of commitment, improved management of water and wastewater companies and technical and economic regulation by the sector regulatory agency led to major improvements in service quality. In addition, USAID supported the corporatization of the water sector. As a result, seven public water utilities that were converted into private companies developed five-year financial plans and four companies adopted computerized cost accounting systems.

To complement these national-level reform efforts, USAID implemented several construction activities to extend new services in six of Egypt's 27 governorates, five of them in Upper Egypt, the poorest region of the country, and one in the Nile Delta. These activities provided assistance in the construction of several small-scale water infrastructure projects, including the design, construction, and expansion of water and wastewater treatment plants and the design of sewer systems. USAID also worked to reduce the spread of disease caused by inadequately treated drinking water and wastewater. USAID/Egypt's health program used mass media, information communication technology, publicity events, and interpersonal activities to improve knowledge and practice of safe water and hygiene behaviors. Communication activities also developed and disseminated hygiene materials in school programs and promoted household hygiene messages in schools and local communities.

Iraq *(map and data next page)*

By supporting community education efforts on water management, disease, personal hygiene, water contamination, and simple water treatment practices, USAID and its partners improved the quality of life for displaced Iraqi families in Diyala and Sulaymaniyah provinces, northeast of Baghdad. Unable to return home, they had limited access to safe drinking water and had to make do with the resources available in temporary settlements. USAID and its partners helped change these conditions, providing fresh water to displaced families and educating



Population	28.8 million
% population lacking access to improved drinking water supply (2006)	urban: 12
	rural: 44
% population lacking access to improved sanitation (2006)	urban: 20
	rural: 31

them about good hygiene. The newly available water enabled families to stay healthy and to perform basic hygiene routines. USAID offered hygiene education in 40 settlements in the two provinces and supported training sessions for community members, teachers, water station caretakers, and religious leaders that promoted hygiene practices and prevention of disease and water contamination. At the end of the training, participants returned to their settlements with important hygiene tips and advice. They worked with hygiene specialists to design appropriate programs and facilitated similar hygiene education sessions in their home communities.

Lebanon

lation	
% population lacking access to improved drinking water supply (2006)	urban: 0
	rural: 0
% population lacking access to improved sanitation (2006)	urban: 0
	rural: ND

From 2002 to 2008, USAID's Lebanon Water Policy Program (LWPP) made substantial and well-timed investments in the South Lebanon Water Establishment (SLWE). Its support enabled a nascent organization to develop plans, put procedures in place, and take action in critical areas while fostering sustainability. As a result, SLWE has become increasingly able to manage its activities and fulfill national government requirements.

A notable impact of the USAID assistance to SLWE came from the development and introduction of new management and analytical tools, including a five-year business plan, a financial cost recovery model, and a financial accounting system, as well as a number of studies and strategic papers in such areas as a wastewater master plan, tariff strategy, and a water optimization plan. These efforts have resulted in a dramatic change in how the SLWE perceives its present efficiencies and its future viability. For the first time, it has a clear vision and is empowered to improve its planning based on sound and accurate financial data.

The introduction of new cultures and concepts in water utility management, such as accrual accounting, human resource management, demand-side management, customer service management, and private-public partnerships, also improved SLWE's efficiency and image. SLWE's adoption of these new cultures and concepts in water utility management represents the first step toward making it a modern water utility and a viable commercial entity operating according to international norms and standards.

The business plan for 2005–2009 has been the centerpiece of SLWE's new image, intricately tied to how it deals with other government entities, donors, investors, and customers. It contributed considerably to increasing transparency by highlighting SLWE's problems, the actions to be taken to solve these problems, the strategic goals to be reached, and the means to reach them. A key problem, for example, was the significant shortage of competent staff to be trained to operate the utility. To make up for this serious problem, SLWE argued for and received approval from the Council of Ministers to hire more than 100 new staff, despite a freeze (in place for over a decade) on new government hiring.

SLWE also secured approval from the Ministry of Energy and Water to hire 18 contract employees through a service contract with a local operator to handle the financial accounting system. This was the only solution to quickly compensate for the lack of qualified employees at SLWE. It is important to highlight that the contract, now in its second year, is funded directly by SLWE, even though it was significantly facilitated by LWPP. This is an example of a public-private partnership best practice, proving that such partnerships in water management are applicable in well-defined areas and contribute to solving some of the major problems of Lebanon's water establishments.

In addressing demand-side management, LWPP launched major awareness campaigns on water conservation, targeting subscribers, students (and therefore, indirectly, their parents), teachers, and heavy consumers. This resulted in widespread understanding that water is a scarce and valuable resource that must be well managed.

Jordan

Water Supply, Sanitation, and Hygiene

Population	5.7 million
% population lacking access to improved drinking water supply (2006)	urban: 1
	rural: 9
% population lacking access to improved sanitation (2006)	urban: 12
	rural: 29

Jordan is one of the driest places on earth, and clean water affects all economic and social sectors and contributes to stability. Recognizing the importance of water as a foreign assistance and development priority, USAID has a long history of participating in water supply and sanitation projects in Jordan, investing in such areas as improved water and wastewater infrastructure, water conservation and efficiency, and policy development. Major achievements are myriad and have recently included:

- A sanitation system that serves more than 2.26 million Jordanians
- A water supply and distribution system that serves 502,000 people
- Adoption of a policy focusing on improved septic systems

USAID

As Samra Wastewater Treatment Plant.

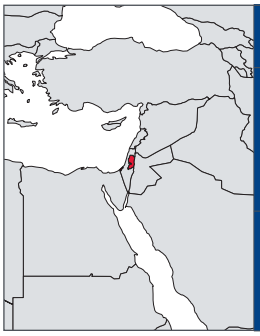
A particularly notable accomplishment in FY 2008 was the official launch of the Wadi Ma'in, Zara and Mujib Water Treatment and Conveyance Project by the Prime Minister, Dr. El-Bakheet, accompanied by Minister of Water and Irrigation Dr. Mohamed Shatanawi and U.S. Ambassador David Hale. USAID invested $104 million in this desalinization plant, which employs cutting-edge reverse osmosis technology and pumps water more than 40 kilometers and up a 1,000 meter hill from the shores of the Dead Sea to Amman. Considered a Jordanian Government water sector "mega-project," the plant provides Jordan with an additional 100,000 cubic meters of drinking water each day, supplying water for 700,000 people and accounting for about one-third of all water distributed in the Greater Amman area.

USAID's Reuse for Industry, Agriculture, and Landscaping (RIAL) Project also received noteworthy recognition in 2008, winning the grand prize for small projects in the 2008 Excellence in Environmental Engineering Competition, sponsored by the American Academy of Environmental Engineers. The project promoted integrated wastewater reuse models addressing agricultural development, industrial applications, and urban landscaping nationwide. RIAL-sponsored improvements resulted in significant cost savings, a 30 percent reduction in freshwater demand, and a 75 percent increase in wastewater recycling at five industrial facilities, conserving more than 150 million gallons of water annually. Strict pollution prevention measures also led to annual savings of $3 million through reduced water, fuel, and chemical consumption. This project's greatest impact was on improving public acceptance and use of reclaimed water, while considering cost, efficiency, and sustainability. Today, Jordan uses more than 80 million cubic meters of treated wastewater annually, and RIAL is considered a model for other countries.

USAID's water and sanitation programs in Jordan also served an estimated 400,000 Iraqi refugees in the country, the majority of whom rely on storage tanks and once weekly public water as their exclusive source of drinking water.

West Bank and Gaza *(map and data next column)*

Approximately 50 percent of the Palestinian population consumes less than 60 liters of water per capita per day, which is barely 50 percent of the minimum standard established by the World Health Organization. Given this low water availability and use situation, USAID placed a high priority in FY 2008 on the provision of essential water and sanitation services to improve the health of Palestinians across the West Bank. During FY 2008, USAID completed more than 25 small-scale activities to improve water facilities within the rural areas of the West Bank; completed a bulk water supply project to benefit the 485,000 residents of the southern part of the West Bank; and procured essential commodities for the construction of a water transmission and distribution system



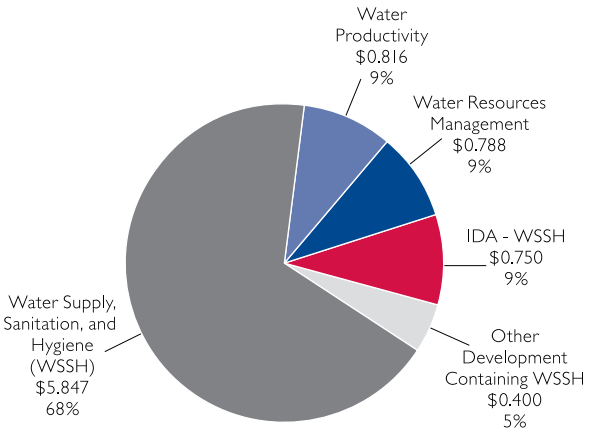
Population	4.0 million
% population lacking access to improved drinking water supply (2006)	urban: 10
	rural: 12
% population lacking access to improved sanitation (2006)	urban: 16
	rural: 31

to serve 10 villages in the northern part of the West Bank. Together, these projects increased access to safe drinking water for 651,000 Palestinians.

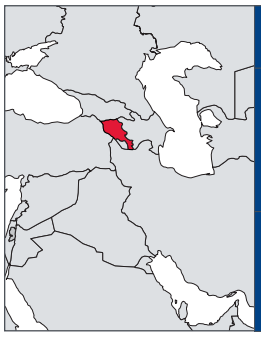
EUROPE AND EURASIA

Figure 11: Estimated USAID Water Funding Obligations by Theme, Europe and Eurasia, FY 2008 ($ Millions)

$8.6 Million (2% of Total)



Armenia



Population	3.0 million
% population lacking access to improved drinking water supply (2006)	urban: 1
	rural: 4
% population lacking access to improved sanitation (2006)	urban: 4
	rural: 19

In FY 2008, USAID assisted with the replacement of approximately 18,000 meters of water supply mainlines and distribution network pipes in 14 villages and a part of Artashat town. As a result of this network rehabilitation, 1,550 people received access to 24-hour water supply, and average access time increased from four to six hours for approximately 45,000 people in the area. Monitoring of groundwater, the source of about 95 percent of Armenia's potable water supply, was also re-established. The activity will ultimately rehabilitate the water supply for the whole town and 27 villages in the surrounding area (approximately 100,000 people), addressing both the design and rehabilitation of the water supply network. By the end of 2009, all residents of Artashat and the 27 villages will have improved water mains and a continuous supply of safe drinking water. By increasing the volume of water delivered by gravity flow to the target area, the project will reduce the need to pump water from deep wells around Artashat and thus reduce energy consumption.

Table 8: Top Receiving Countries, WSSH Funding,* Europe and Eurasia, FY 2008

Receiving countries	$ (millions)	Percent
Kosovo	4.50	64.3
Georgia	1.25	17.9
Armenia	0.89	12.7
Other (2 countries, 1 Regional Mission)	0.36	5.1
Total WSSH/Europe and Eurasia	7.0	

* Estimated obligations and commitments

Small reconstruction projects under the Assistance for Europe and Eurasia Program concentrated on structural renovation of hygiene and sewage facilities in schools and health centers, improving both the health and quality of life of residents. In FY 2008, $50,000 supported projects

in a boarding kindergarten (kitchen and laundry), a special boarding school (kitchen and cafeteria), and a rural ambulatory care center.

The regulatory environment for water supply companies was improved, which resulted in better quality of services. To further support water supply and sanitation reforms, USAID/Armenia provided technical assistance for 1) establishing a sustainable, capital market-linked financing mechanism for water services; 2) improving selected laws and regulations of the water and sanitation sector, in particular pretreatment legislation to control industrial discharges to public systems; 3) strengthening the Public Service Regulatory Commission's capacities to renegotiate water contracts and develop and apply tariff methodologies, especially as they pertain to the protection of vulnerable populations, to full cost recovery tariffs; and 4) building the Commission's overall information capacity in water supply, conservation, and management.

With the participation of the Coca-Cola Company, the United Nations Development Program, and Dilijan municipality, USAID/Armenia also proposed a Global Development Alliance activity to install a sewerage treatment plant and associated sewerage network and carry out community mobilization and awareness activities to reduce pollution in the Aghstev River. In addition to protecting the ecosystem in the Dilijan area, this activity, which is expected to last two years, will have social and health benefits and contribute to improving the tourism potential of the area. USAID will contribute $200,000 (to be obligated in FY 2009 from the FY 2008 earmark) to this activity.

Kosovo

Population	ND
% population lacking access to improved drinking water supply (2006)	urban: ND
	rural: ND
% population lacking access to improved sanitation (2006)	urban: ND
	rural: ND

USAID launched a new water and sanitation activity at the end of FY 2008 to expand access to safe water and sanitation services to several municipalities. Two ongoing activities also included activities that contributed to the water and sanitation objective:

- A conflict mitigation program that aims to improve the quality of life for Kosovo's minority communities through small infrastructure upgrades completed four water-related projects that provided the infrastructure for delivering safe drinking water to more than 6,000 people in participating communities.

- A public outreach effort, conducted in cooperation with NATO peacekeeping forces in Kosovo, encouraged conservation after a dry winter raised concerns about a water shortage. The U.S. Government contribution included the production and broadcasting of public service announcements and the creation of public education materials for distribution throughout Kosovo by NATO soldiers.

Moldova

Population	3.6 million
% population lacking access to improved drinking water supply (2006)	urban: 4
	rural: 15
% population lacking access to improved sanitation (2006)	urban: 15
	rural: 27

Through small grants to civil society organizations in rural and urban areas, USAID provided access to drinking water and training to communities in sustainable management of water and sanitation services. Communities were revitalized, and community members strengthened their capacity to play a more active role in local decisions that concern their health. Community members were trained to identify and prioritize local needs; develop solutions and action plans to address these needs; implement projects; evaluate results; and develop follow-up actions in areas of local community interest. Targeted sectors were small business and farming skills development; improvement of sanitary conditions; increasing youth participation in community life; and improving access to information sources. Participants included teachers, youth, entrepreneurs, farmers, NGO members, and others.

Russia *(map and data next page)*

A USAID partner, the Fund for Sustainable Development (FSD), implemented more than 10 activities as a part of the Amur River Initiative, designed in response to the dramatic contamination of the river by Chinese in-

Population	143.2 million
% population lacking access to improved drinking water supply (2006)	urban: 0
	rural: 12
% population lacking access to improved sanitation (2006)	urban: 7
	rural: 30

dustry and upstream cities, to organize a public monitoring system and improve drinking water quality in settlements along the river in Khabarovsk Krai. These activities benefited more than 13,000 citizens, including children, the elderly, and indigenous peoples.

FSD's work also generated similar activities funded by local businesses and municipal budgets, which co-invested more than $100,000. Based on the broad response to the initiative from both regional and local authorities, FSD explored the possibility of replicating these efforts to help meet the urgent needs of small Amur riverbank settlements for clean and safe water.

JOINT EUROPE REGIONAL

Through a Joint Europe Regional activity, USAID supported a consultative process involving more than 50 representatives of governmental and nongovernmental stakeholders to facilitate the development of a water utility reform plan for the Government of Montenegro. The plan was adopted by the Parliament, and the people and economy of Montenegro will benefit immensely if the reforms are implemented and the legislative foundation embodied in the draft law adopted. The benefits include increased reliability of water supply, enhanced water quality, and improved wastewater treatment and disposal that observe sound environmental practices. Improved water supply and sanitation will remove a major constraint to tourism and generate trade, transport, banking, agriculture, and construction. Such expansion should translate into lower unemployment, an increased standard of living, and gains in rural and regional development. The reforms should also reduce pollution and mitigate lack of access to water supply and sewerage utility services now experienced by some minorities and the poor. In addition, USAID assisted Montenegro with a draft application for funding remaining water utility reform plan activities through the European Union (EU). If granted, other reforms called for in the plan would be funded by the EU.

USAID also achieved consensus among stakeholders in Montenegro on a proposed draft law on the organization and provision of water supply and wastewater management service. The proposed law is awaiting final comments from the Legislative Secretariat and, if adopted,

ANVAR ILYASOV,2002

the primary legal precondition to water utility reforms will be in place.

A highly successful regional workshop on best practices in water utility management, finance, and performance improvement, organized by USAID in Herceg Novi, Montenegro, included 19 presentations and attracted more than 100 participants from 27 countries, primarily from both the Europe and Eurasia regions.

JOINT EURASIA REGIONAL

As a result of the work performed under USAID/Georgia's Infrastructure Reform and Finance (IRF) Project to restructure the water sector, the Government of Georgia created a high-level water reform commission chaired by the Prime Minister. This effort led to the preparation of a technical assistance project, currently under the same contract, for the formulation of a water utilities sector reform program. Under the program, USAID is assessing the rehabilitation needed in water and sanitation, particularly in the areas affected by the recent invasion.

U.S. Government assistance in Nagorno-Karabakh focused on rehabilitating basic health, water, and shelter infrastructure destroyed or damaged as a result of the war. Throughout the project (2002–2008), USAID supported renovation and upgrade of 17 water systems in three regions of Nagorno-Karabakh. The program addressed infrastructure needs by renovating or reconstructing water reservoirs, repairing pipes, and connecting the source to reservoirs. Rehabilitated water systems contributed to improved living conditions, increased water supply, and better sanitation in rural settings. Upgraded water and sanitation systems also promote better health in the general population.

USAID's Europe and Eurasia Bureau undertook a number of assessments, evaluations, workshops, and conferences through the IRF Project at the request of USAID/Ukraine and USAID/Central Asian Republics. All activities discussed, assessed, and recommended actions for revolving funds, pooled financing, and public-private partnerships in Ukraine and Kazakhstan. Revolving funds and partnership initiatives in those countries have the potential to impact multiple infrastructure sectors, including water, transportation, telecommunication, and energy.

LATIN AMERICA AND THE CARIBBEAN

Figure 12: Estimated USAID Water Funding Obligations by Theme, Latin America and the Caribbean, FY 2008 ($ Millions)

$36.5 Million (7% of Total)

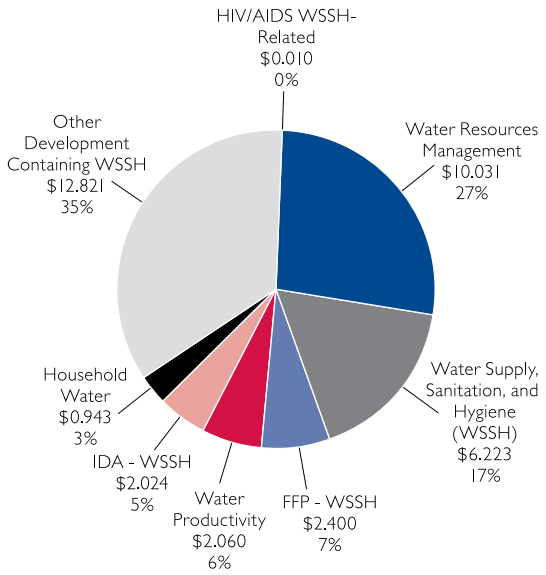


Table 9: Top Receiving Countries, WSSH Funding,* Latin America and the Caribbean, FY 2008

Receiving countries	$ (millions)	Percent
Haiti	10.61	43.4
Ecuador	5.98	24.5
Bolivia	3.92	16.1
Nicaragua	1.97	8.1
Other (4 countries)	1.95	8.0
Total WSSH/Latin America and the Caribbean	24.42	

* Estimated obligations and commitments

Bolivia

(map and data next page)

Water supply and sanitation aimed at enhancing the health and well-being of targeted populations is a critical element of USAID's Food for Peace Program. The Program achieved its goals in FY 2008 by focusing on the construction, operation, management, and maintenance of water supply and sanitation systems. Different sectors and population groups, including infants, adults, pregnant women, rural populations, and community-based organizations benefited from the Program, and more than

WSSH SUCCESS STORY – Bolivia

A Community Takes Action

Despite their proximity to the capital La Paz, the capital of Bolivia, many rural, indigenous communities in La Paz department still lack clean water and appropriate sanitation facilities. At an altitude of more than 13,000 feet, these communities experience drastic climactic conditions, including cold, dry, and dusty air. Campaigns to promote handwashing and hygiene have had limited impact due to the lack of clean water in households. But in the community of Cañuma – which in the native language means "dirty water" – in Calamarca municipality, about 68 kilometers from La Paz, this situation is changing. Thanks to a Save the Children food security, water, and sanitation activity under USAID's Title II Food Security Program, families in Cañuma have access to water and sanitation facilities.

Like many Cañuma residents, Ancelma and Senovio Colque and their three children had poor access to clean water. When one child became gravely ill with diarrhea and began losing weight, the family learned from the health center that a lack of clean water and sanitation is a leading cause of diarrhea and, consequently, malnutrition. Mr. Colque contacted the municipality and Save the Children in the hopes of constructing a potable water system for the community. The municipality, the community, and Cañuma families offered both cash and labor to assist with the construction, and with assistance from private U.S. donors and the Japanese Government, the Save the Children team, with more than five years experience in rural water and sanitation systems, began constructing the system.

Realizing the impact that clean water would have on his own children's health, Mr. Colque became a leading member of the Public Works Committee and then president of the Potable Water and Sanitation Committee, responsible for maintaining the potable water system and making sure the community practices adequate hygiene habits. Once the system was completed, the Colques and other families received a full bathroom with sink, toilet, and an electric shower. The bathroom septic system will last for years, as waste empties into one tank for approximately two to three years and can then be diverted into the second tank. By the time the second tank is full, the first tank can be emptied, and waste material has decomposed sufficiently, so it can be used safely as fertilizer.

Population	92 million
% population lacking access to improved drinking water supply (2006)	urban: 4
	rural: 31
% population lacking access to improved sanitation (2006)	urban: 46
	rural: 78

60,000 people in target areas received access to improved drinking water and/or sanitation services or facilities.

During FY 2008, the Integrated Alternative Development program invested $1.2 million to complete 18 potable water systems in coca-growing regions, improving living conditions and well-being for nearly 730 families. An investment of $800,000 produced eight sewerage systems serving 338 families. The communities served by these activities contributed approximately $500,000 of their own funds. The water and sewerage systems have a training component to help guarantee quality of service and sustainability.

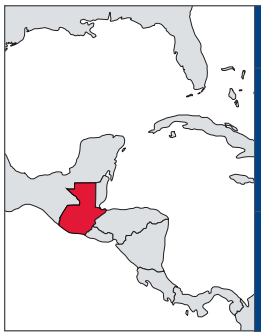
Ecuador

Population	13.2 million
% population lacking access to improved drinking water supply (2006)	urban: 2
	rural: 9
% population lacking access to improved sanitation (2006)	urban: 9
	rural: 28

In FY 2008, USAID brought potable water to more than 9,500 people and provided access to sanitation facilities for nearly 2,600 people. Moreover, about 55,000 mothers, children, teachers, and health workers received information from a hygiene promotion campaign in schools, child care and community centers, and the media. Surveys of the target group found that 75 percent of mothers

and children could recall the handwashing messages; 92 percent of mothers reported using better practices; and 72 percent of children reported washing their hands with soap before eating. In addition to the campaign's effective training materials and methods, much of this success was due to the effective alliances built with USAID counterparts in the Ministries of Health and Education, especially the very motivated teachers who have supported incorporating the program as a pillar of the National Education Plan.

Guatemala



Population	12.6 million
% population lacking access to improved drinking water supply (2006)	urban: 1
	rural: 6
% population lacking access to improved sanitation (2006)	urban: 10
	rural: 21

To increase sustainable access to safe drinking water and sanitation for poor Guatemalans, USAID entered into an alliance with the Council of Companies, Foundations, and Institutes of Guatemala to support education, health, and nutrition in 218 communities in two of the country's poorest departments. Women of reproductive age were educated on healthy practices and nutritional behaviors, including home-based water purification methods, water chlorination activities, and waste management. The alliance will benefit 8,000 women and 7,500 children under age 5. USAID also funded the disinfection of 9 million liters of water as part of the alliance building program with the private sector.

In addition, the Food for Peace Program worked with rural poor communities to address the widespread lack of safe water by repairing water systems and latrines and by teaching families simple ways of collecting and purifying water.

Mexico *(map and data next column)*

Access to running water is considered a right in Mexico. Households frequently do not pay for their water, and when they do, they often pay a highly subsidized, low monthly quota rather than for the actual cost of monthly water consumption. According to the Government, 95.5 million people (90 percent of the population) had access to water in 2008.

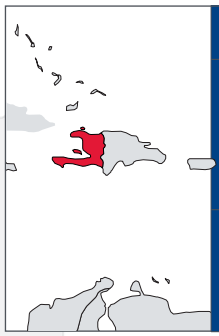
Population	105.8 million
% population lacking access to improved drinking water supply (2006)	urban: 2
	rural: 15
% population lacking access to improved sanitation (2006)	urban: 9
	rural: 52

U.S. assistance aims to increase resources for water and sanitation infrastructure through an innovative capital financing approach and to improve energy efficiency in the provision of drinking water. Until 2002, local governments relied solely on financing provided through the federal government and short-term commercial bank loans. Partnering with the Minneapolis-based Evensen Dodge financial advisory firm in a $2.2 million Global Development Alliance, USAID has enabled subnational governments to access Mexico's capital market and lower the cost of borrowing with impressive results – $800 million leveraged for infrastructure investments. By introducing innovative legal structures that have become market standards, USAID has had an impact on the entire $13 billion Mexican subnational finance market. Some local governments have chosen to provide capital for water and sanitation. In FY 2008, the Institute for Development in Quintana Roo state served as the financing vehicle for $30 million for the State Water Utilities Corporation. The bank loan was issued at the lowest interest rate ever achieved by a water facility in Mexico.

Small investments in technical assistance have made a significant impact on improving access to potable water in urban areas and fostering private sector participation in the water sector. Through its Watergy Program (a program that identifies opportunities for combined water and energy efficiencies in municipal water systems), USAID engaged federal authorities and state and municipal water utilities in a joint effort to apply best practices for efficient water and energy management. The program focused on water utilities along the U.S.-Mexico border. Water utility staff received training and technical advice on practical topics such as decreasing water pipe leaks to avoid both water loss and contamination, changing inefficient water pumps for newer ones, and installing demand-side management devices that activate water pumps at low-electricity usage hours (which lowers energy costs to the water utilities) while still keeping water pressure throughout the day. The Watergy Program rec-

Haiti

Water Supply, Sanitation, and Hygiene



Population	8.5 million
% population lacking access to improved drinking water supply (2006)	urban: 30
	rural: 49
% population lacking access to improved sanitation (2006)	urban: 71
	rural: 88

Haiti ranks very low on all international water and sanitation indices. Nearly 6 percent of Haitian children die before age 5, many as a direct result of preventable waterborne diarrheal diseases. Water, especially potable water, is becoming an increasingly scarce resource. The amount of time and effort to ensure a minimal water supply creates a challenging environment that takes a toll on the potential for socioeconomic development, especially in rural areas. The Government lacks resources and trained staff to implement water and sanitation programs, upgrade aging water supply systems, collect fees, and ensure proper operation and maintenance of systems.

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Limited fresh water in Haiti means that the same water source is used for bathing, washing clothes, and even drinking.

USAID/Haiti seeks to close the gap between the responsibilities of the Government and the actual delivery of water in Haitian communities. In FY 2008, USAID assistance supported several programs that provided clean drinking water to 451,000 people and improved sanitation facilities to 163,200 people. Water projects are cost-effective interventions that yield savings of more than $3 per $1 invested while reducing diarrheal disease by 30 to 50 percent.

USAID's FY 2008 water programs in Haiti prevented disease and death and improved the quality of life for Haitians, primarily benefiting women, who typically bear the burden of obtaining household water, and children. Health programs pilot-tested water treatment tablets in five communities, and Haitian households used more than 49 million liters of treated water at a cost of $0.90 per person per year. More than 14,000 cases of severe diarrhea were averted. USAID also provided access to safe water to approximately 10,000 HIV/AIDS-affected households in 10 departments, benefiting more than 50,000 individuals. Five clinics, 50 schools and orphanages, and 79 households received sand filters for water purification under the "Pure Water for Haiti" Initiative, a partnership between USAID and Rotary International. Teachers, clinic directors, and household heads received training on sanitation, hygiene, and the use of the filters, and 156 extension agents and technicians received training on the filtration system.

The Food for Peace Program completed sanitation projects in health facilities and schools and capped springs in 15 remote areas, providing 144,000 people with improved facilities and giving access to improved drinking water to 21,000 people. Several food-for-work activities addressed water problems in the countryside. These included construction of three water reservoirs and 13 cisterns and rehabilitation of two washing sources and two watering sources. Residents of two communities participated in building wells to alleviate water scarcity.

The Peace and Security Program completed 62 clean water activities in six "hot spot" cities and improved sanitation facilities at 25 schools, increasing access to clean water for more than 380,000 persons. Projects included well drilling, capping and protection of hillside springs, soil erosion control measures upstream from drinking water sources, and provision of new pumps and spare parts. Beneficiaries included 10,000 students, a public hospital, and urban and rural households. New latrines benefited 19,200 students, and 70,000 households gained easier access to clean water. The Program also cleared urban drainage canals that served as public toilets and garbage disposal sites and were a source of enormous public health hazards, including diarrheal diseases and point pollution of shallow aquifers.

ommended installation of home water meters for accurate billing and water pressure regulators for the overall water system to protect pipes and save water. The cities of Monclova, Hidalgo del Parral, Guaymas, Nogales, and Durango took action on the Watergy recommendations. By increasing their water and energy efficiency, the cities' water utilities saved more than 25.4 million kilowatt/hours of energy, resulting in an estimated annual savings of more than $4.3 million. Energy savings have allowed these water utilities to expand water access from eight to 24 hours daily for more than 1.4 million people in these cities. The cities were also able to expand water access to more than 76,650 people who previously had no access to water. Ultimately, the Watergy Program's greatest impact is its demonstration effect for other water utilities. In 2008, three other municipalities and their water utilities began using the Watergy methodology with U.S. assistance. Thus, the United States has been able to help ensure a safer drinking water supply for a number of cities in the high-priority border area of northern Mexico.

Nicaragua *(map and data next column)*
USAID assistance during FY 2008 included the construction of water systems serving thousands of beneficiaries in rural communities throughout Nicaragua, including three water systems serving more than 2,000 beneficiaries in five communities in the northern department of Jinotega. Several water systems were also repaired in the aftermath

Population	5.5 million
% population lacking access to improved drinking water supply (2006)	urban: 10
	rural: 37
% population lacking access to improved sanitation (2006)	urban: 43
	rural: 66

of Hurricane Felix, and USAID distributed personal hygiene kits.

USAID-provided water filters and training in the use of solar disinfection methods for potable water helped 15,000 beneficiaries gain access to clean water. Water gauges and water filters were installed in several thousand rural homes. Under the "Home with Healthy Water" program, 23 volunteers conducted 1,296 visits to 310 homes to demonstrate safe water use. USAID cofunded a major water and sanitation project with El Jicaro municipality in Nueva Segovia department that benefited more than 7,800 people through the installation of 868 latrines and construction of 16 wells.

In addition, a USAID-funded community health program implemented hygiene activities and solar disinfection of water in 267 rural communities.

A woman in Jinotega, Nicaragua, brushes a clay water filter. Cholera is epidemic in the area. The water filters use local clay to naturally filter out harmful bacteria.

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II. Water Resources Management Activities

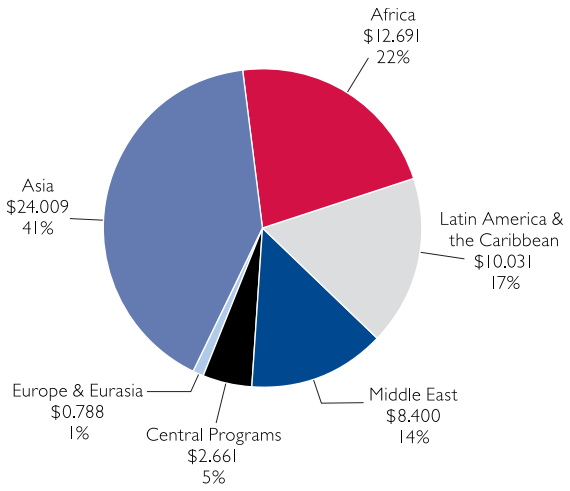
AECOM INTERNATIONAL DEVELOPMENT

Halong Bay, Vietnam. Halong City is the site of a USAID/ECO-Asia water resources management activity.

Every country and community depend on sustainable fresh water of sufficient quantity and quality to meet society's needs, sustain economic growth, and maintain ecosystems, and all countries and communities face the challenge of how to best use and protect finite but renewable resource. Water resources and hydrologic systems are under enormous pressure today from population growth, environmental degradation, and climate change. The clearing of 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 (replenishment), and greater potential for floods and droughts. Climate change may exacerbate these impacts, potentially forcing shifts in human settlements and agricultural practices and dramatic changes in livelihoods. Most countries share water resources with others, further complicating the management of this essential resource.

Figure 13: Estimated USAID Water Resources Management Obligations by Region, FY 2008 ($ Millions)

$58.58 Million, 12% of Total Water Obligations*



* FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.

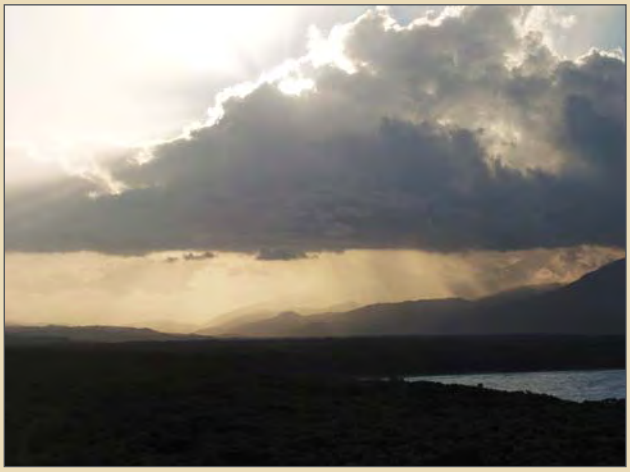
The objectives of water resources management (WRM) include optimizing the benefits of drinking water among competing uses while ensuring that human needs are met and environmental resources are protected, as well as supporting efforts to manage and/or adapt to hydrological variability and the risks of floods and droughts. Achieving these 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, as they are expensive and disruptive and interfere with efforts to relieve human suffering, reduce environmental degradation, reduce vulnerability to future disasters, and achieve economic growth.

Illustrative WRM activities include improving water resources planning; addressing water quantity and quality challenges; strengthening participatory governance through multistakeholder approaches; mobilizing financing; and managing hydrologic variability. To help governments, civil society, and communities plan, finance, and regulate instruments for transparent and equitable water allocation and management, USAID engages in:

- Broad-based policy development and institutional strengthening, based on multistakeholder input and dialogue
- Strategies and structures to conserve the quality and supply of water
- Surveys dealing with water balances, water supply, aquatic life, and habitat protection
- Transboundary WRM focusing on data sharing and common protocol development in river basins shared by two or more countries

In specific settings, WRM activities promote the conservation and sustainable use of water resources in freshwater and coastal areas, thereby protecting the quality of surface water and groundwater for drinking, irrigation, and other uses, while maintaining aquatic ecosystem services provided by rivers, lakes, aquifers, fisheries, wetlands, and coastal environments. WRM also addresses a wide array of land uses within watersheds that may have local impacts while also affecting downstream communities and ecosystems. Integrated WRM, water quality protection, and pollution prevention and control support the management of ground and surface water and their watersheds. WRM also promotes environmentally sound technologies and clean production practices that reduce the amounts of raw material, water, and energy used in agricultural, industrial, manufacturing, and other production processes. WRM programs also seek to enhance the beneficial uses of water

USAID Activities in Response to Water-Related Effects of Climate Change



JERRY BAUER

Combined with population growth and increased demand for water, changes in water availability or quality related to climate change may contribute to future water scarcities that cannot meet the needs of ecosystems, agriculture, industry, and human consumption. Climate change is expected to affect the water cycle through higher temperatures, resulting in changes in the timing, amount, and form of precipitation. Although the ability of climate models to project changes in precipitation is fairly uncertain, it is understood that a warmer atmosphere absorbs more moisture through evaporation and transpiration. It is thus expected that many regions will see fewer, but more intense, rainfall events. Changes in timing, form, and geographic range of precipitation may also result in more rain than snow and in changes in monsoon onsets. Many regions are already seeing a loss of glacier and snow pack storage and changes in peak runoff, resulting in floods and altered downstream ecosystems. Other areas are seeing more frequent and prolonged droughts, which are expected to continue. Another effect of climate change is warmer ambient air temperatures, which lead to warmer water, lower dissolved oxygen content, hypoxia, and altered aquatic biology.

Like water, climate change is a cross-cutting issue. Virtually every development sector or objective is either directly or indirectly linked to successful WRM, and USAID is expanding its work on the water sector dimensions of global climate change:

- To help project planners and their partners address the impacts of climate change, USAID has developed the *Climate Change Adaptation Guidance Manual* to provide the tools planners need in order to understand how climate change may affect projects relating to watershed protection and reforestation (one of USAID's overarching objectives), water utility management, water treatment systems and management, modeling of water resources, and hydrometeorological forecasting.
- The Agency has also completed *Adapting To Coastal Climate Change: A Guidebook For Development Planners*. The guidebook is designed to address the needs of decisionmakers and coastal managers and presents a framework and approach for assessing coastal vulnerabilities as well as specific measures for reducing them. It is being piloted in the Marshall Islands.
- In collaboration with the National Oceanic and Atmospheric Administration and the University of Rhode Island, USAID is supporting training courses on coastal management and climate change in Vietnam, the Philippines, and Ecuador.
- USAID is beginning new work on guidance materials and training focused on water availability, water quality, and water issues associated with agriculture, glacier loss, and metropolitan urban growth. Several pilot studies will inform the development of these efforts.
- USAID is holding a workshop in Peru on the impacts of glacier melt on different socioeconomic sectors in the Andes. Decisionmakers and experts from multiple fields, including glaciology, hydrology, agronomy, energy management, and ecology, will consider agendas for action and further research. A similar workshop in the Himalayas is under consideration.

USAID

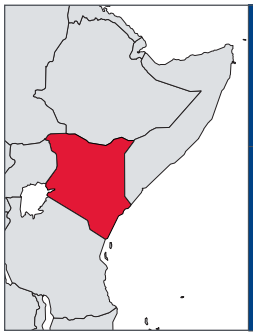
and reduce human health risks from water by reducing, preventing, and mitigating water pollution.

In FY 2008, USAID reported nearly $58.6 million in WRM, up from $27 million in 2007. Africa reported $12.7 million, or 22 percent of this total, with the largest project dealing with agricultural soil and water management and watershed conservation in Ethiopia, mixed with water productivity and improved efficiency of water use. Asia reported $24 million (41 percent), and the Middle East reported $8.4 million (14 percent).

WRM Activities by Region and Country

AFRICA

Kenya



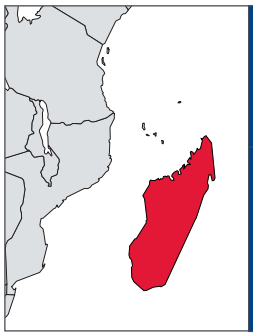
Total actual renewable water resources per capita (m^3/yr) (2006)	840
Proportion of renewable water resources withdrawn (2001)	9%

Sources for above statistics for Kenya and other countries covered in this chapter: Renewable Resources Per Capita – Food and Agriculture Organization, AQUASTAT, Water Resources by Country/Territory and by Inhabitant, and MDG Water Indicator. Renewable Resources Withdrawn – MDG Water Indicator. The proportion of renewable water resources withdrawn shows a measure of pressure on water resources as a percentage of total renewable fresh water withdrawn by all sectors (agricultural, municipal, industrial, etc.).

With USAID support, the Green Belt Movement[4] rehabilitated degraded areas of the eastern side of the Aberdares Forest by planting 200,000 indigenous trees. The forest is the core catchment for the Ndakaini Dam and the Seven Folks hydropower plants that supply drinking water to Nairobi and its environs. Tree planting and range land rehabilitation efforts by the Laikipia Wildlife Forum, the International Small Group & Tree Planting Program, National Museums of Kenya, and the Northern Rangelands Trust contributed to the improvement of various water catchments in the Laikipia, Meru, Arabuko Sokoke, and Isiolo regions. Core watersheds impacted by these programs include the Mukogodo and Arabuko Sokoke Forests and the Mathews Range Forest Reserve. In total, 3.7 million seedlings were planted by USAID natural resources management programs.

[4] The Green Belt Movement is a grassroots NGO based in Nairobi, Kenya, that takes a holistic approach to development by focusing on environmental conservation, community development, and capacity building. Professor Wangari Maathai established the organization in 1977 under the auspices of the *Maendeleo Ya Wanawake* (National Council of Women of Kenya).

Madagascar

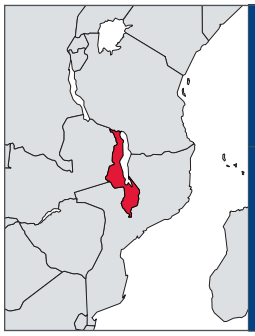


Total actual renewable water resources per capita (m^3/yr) (2006)	17,590
Proportion of renewable water resources withdrawn (2001)	4%

USAID continued to support the establishment and effective management of protected areas to conserve biodiversity and maintain the ecological functions of watersheds. USAID improved governance of natural resources through effective zoning, control, and management of forests to ensure the maintenance and integrity of watershed functions. Activities supported local communities in improving watershed management through an agro-ecological approach using techniques such as reforestation and forest restoration. Environmental education programs increased awareness of the hydrological cycle and the impacts that land use decisions may have on water quality and availability. Watershed management in large corridors within protected areas provided clean water for local communities and for agricultural and rural enterprises. Water user groups took part in activities to support sustainable use of water resources and equitable water allocation.

USAID also promoted multiple-use water systems that advanced ecological goals while improving agricultural production and food security, with agricultural yields increasing through the rehabilitation of irrigated rice perimeters and the use of new technologies such as micro-irrigation systems and pedal pumps.

Malawi



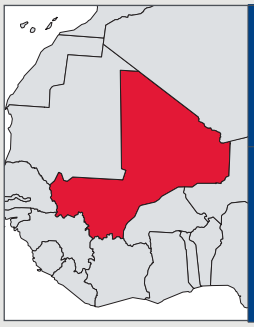
Total actual renewable water resources per capita (m^3/yr) (2006)	1,273
Proportion of renewable water resources withdrawn (2001)	6%

USAID assisted with protecting watersheds and catchment areas and building long-term, sustainable, and equitable supplies for local users of water originating from important ecological sites. As part of a public-private partnership with the Coca-Cola Company, USAID assistance improved the governance of water resources through institutional strengthening and the formation of water user groups in the Mulanje Mountain watershed. USAID provided training for village water committee members in Mulanje district. Communities in surrounding areas attained a broader understanding of water conservation, and public participation in watershed

WRM SUCCESS STORY – Mali

Shared Governance Project Improves Water Management by Communities

In FY 2008, USAID/Mali's Shared Governance Through Decentralization program worked with water management committees in 152 communes, increasing their effectiveness in setting water usage rates, collecting fees, and otherwise managing the overall supply of clean water. The program worked with local commune officials and water management committees to improve their effectiveness in managing and distributing water resources and to overcome constraints related to water management. Efforts included helping communes play a more proactive role in managing distribution systems, helping them mobilize matching funds from water management committees, and training in water infrastructure financing and the calculation of water usage fees.



Total actual renewable water resources per capita (m^3/yr) (2006)	8,355
Proportion of renewable water resources withdrawn (2001)	7%

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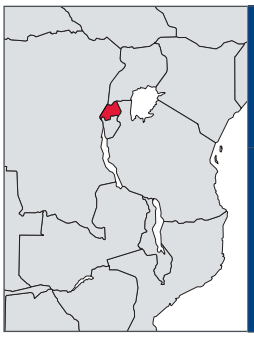
A woman collects water from a well in Mali.

In all project zones, either new water distribution management systems were established or existing systems were strengthened. Communes made important headway in developing participatory processes for managing water resources, with protocols negotiated and signed with water management committees in 97 target communes (64 percent). Water management committees began to collect water usage fees from communities as well as the 3 percent sales tax authorized under Malian law.

In Djenné commune, the program succeeded at mediating tensions between commune leaders and residents, who were refusing to pay higher water management fees. After a series of sessions with local leaders, officials, and the water management committee, water consumers understood the costs of providing potable household water and maintaining the distribution system. Eventually, they agreed to pay higher fees for the water. Without the intervention of the USAID program, fee collection would have been insufficient to cover the costs of providing water to the commune, which would have led to serious intercommunal conflict and possibly to a public health crisis.

conservation efforts increased. Reforestation of upper watersheds and better management of sloping agricultural lands helped protect and rehabilitate watersheds. Watershed management also increased income and nutrition levels due to the increased amount of land under irrigation and cultivation of high-value crops. USAID also trained 284 members of 27 water user groups on gender and conflict management.

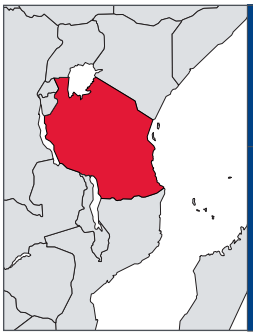
Rwanda



Total actual renewable water resources per capita (m^3/yr) (2006)	1,004
Proportion of renewable water resources withdrawn (2001)	2%

Water activities were linked to the USAID ecotourism development and biodiversity conservation project in and around the Nyungwe National Park. It is commonly believed that the value of water catchments and climate regulation in Nyungwe Forest far exceeds the forest's value for tourism and other uses. This is directly related to the ability to "value" the potential of the forest and thus to sustainable financing mechanisms that could be developed to the benefit of surrounding communities. In this regard, USAID analyzed sustainable financing options, including payment for watershed conservation, and completed an evaluation that estimated the dollar value of selected ecosystem goods and services (watershed protection, maintenance of biodiversity, opportunity for recreation and tourism, and carbon storage and sequestration) provided by Nyungwe National Park. The total value of these goods and services was estimated at $120 million to $370 million per year. Stored carbon was valued at $97 million to $345 million per year, while watershed protection services (water supply for irrigation, water for human consumption and industries, and flood protection) were valued at $20 million to $21 million per year. Upon completion of the study, USAID organized a workshop to present the study results and policy recommendations to stakeholders. In follow-up discussions with Rwanda's Office of Tourism and National Parks, USAID presented recommendations aimed at establishing payment schemes for environmental services provided by water resources. One of the recommendations was to recover payments of $5.4 million per year from a local tea factory for the value of water extracted from the park.

Tanzania

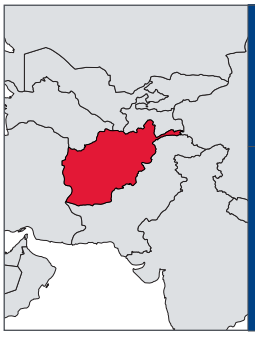


Total actual renewable water resources per capita (m^3/yr) (2006)	2,440
Proportion of renewable water resources withdrawn (2001)	5%

In support of the Government's national strategy for growth, poverty reduction, and improvement of human health and safety, USAID promoted sustainable management of watershed and water resources (quality and quantity) in targeted landscapes. Assessment of current watershed conditions in critical ecosystems in and around the targeted landscapes identified primary threats to water quality and quantity. Delineation of watershed boundaries and source water protection areas provided a better understanding of WRM issues and protective measures to improve water quality and sustain water flows to improve the health of local populations. These efforts led to the incorporation of several strategic activities to strengthen WRM and improve water supply and sanitation. They also yielded insights and inputs for future long-term planning at the landscape scale. Similarly, monitoring efforts provided a pathway for future USAID support as well as valuable real-time data on water supply and quality.

ASIA

Afghanistan



Total actual renewable water resources per capita (m^3/yr) (2006)	2,492
Proportion of renewable water resources withdrawn (2001)	36%

The U.S. Government supported the Ministry of Energy and Water in developing the water sector strategy of the

Afghanistan National Development Strategy. Seven ministries and various donors vetted the water strategy. During this process, Afghanistan held its first water resources conference. USAID assistance provided a foundation and structure for strategic management of Afghanistan's water resources. This assistance took a variety of forms, including:

- Training on the operation and maintenance of water distribution systems for operators and technicians in Gardez, Ghazni, and Chil Dukhtaran in Kabul province
- Support for institution building via assistance to the Technical Secretariat of the Afghan Supreme Council for Water Affairs Management
- Support for developing the Secretariat's work plan and facilitating the establishment of working groups involving 130 staff from more than 30 ministries on sustainable water resources development
- A drought management strategy workshop attended by 70 professionals from government, donors, NGOs, and academia
- Various workshops and technical group meetings that used collaborative and participatory mechanisms to engage different stakeholders

Catholic Relief Services' watershed restoration project in Ghor province continued to apply community-based approaches to addressing water insecurity. The project is increasing the availability and accessibility of water for agriculture and domestic use in seven watershed areas by introducing microwater catchments, embankments to intercept water runoff, and terracing to reduce soil erosion and trap sediment. The project will provide households in target communities with access to sufficient quantities of safe water from protected water sources for productive and domestic uses.

Indonesia

Total actual renewable water resources per capita (m^3/yr) (2006))	12,400
Proportion of renewable water resources withdrawn (2001)	3%

In FY 2008, USAID/Indonesia worked with communities, local governments, water utilities, and the private sector to develop and implement water resources protection and land/forest rehabilitation in areas essential to protecting raw drinking water supplies for large urban populations and water utilities. More than 177,300 hectares of degraded land were rehabilitated to restore ecosystem services. Land rehabilitation is intended as a tool to stabilize water flow and improve water quality, particularly through reduced sedimentation during the rainy season.

Kazakhstan *(map and data on page 57)*

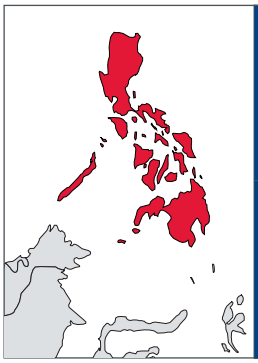
Through the State Department's International Visitor Leadership Program, one official from the Ministry of Environmental Protection, one from the Ministry of Agriculture's Committee for Water Resources, and an expert from the Central Asian Regional Environmental Center visited the United States to study WRM in the United States and strengthen links with U.S. water experts. With an emphasis on capacity building for local government agencies and water resource experts, the participants exam-

USAID

Flooding along the Helmand River in Afghanistan.

Philippines

Water Resources Management



Total actual renewable water resources per capita (m^3/yr) (2006)	5,553
Proportion of renewable water resources withdrawn (2001)	6%

A 2008 analysis of forest conservation needs in the Philippines showed that while there is an increase in forest cover in the country, most of the increase is from secondary growth, plantations, and lands converted to commercial higher-value tree crops. Although this type of forest cover contains biological diversity and is certainly better than no cover at all, it does not have the complexity or diversity of natural forest cover. If threats to forests and watersheds are not addressed, the ability of watersheds to continue to provide a regular supply of water with high water quality will be greatly impaired, with great effects on human health and livelihoods.

DAI

Lake Sebu, Philippines.

A broad range of USAID activities in the Philippines are aimed at improving national and local capacities to resist continued fragmentation of forests and watershed ecosystems. These activities seek to maintain healthy forest/watershed ecosystems that provide steady streams of environmental services, including a quality water supply for drinking and agriculture. Improved watershed management practices that minimize soil erosion and siltation help ensure that the environmental services of the watershed, including water supply for domestic, agricultural, and renewable energy use, are sustained.

USAID focuses on implementing forest land use plans that identify areas for protection, conservation, and development; supports the issuance of local environmental laws and their enforcement; and strengthens resource use and property rights within watershed areas. USAID's assistance is already helping barren areas become productive, as illustrated by the following results achieved in 2008:

- More than 230,000 hectares were placed under improved natural resource management.
- Awards of individual property rights to upland farmers from community-based forest organizations increased more than twofold from 2007, to about 570 from about 240.
- A partnership involving the U.S. Department of Interior and the Philippine Tropical Forest Conservation Foundation helped environmental authorities take action against illegal logging in Northern Sierra Madre, the biggest and most important protected area in the country, with the seizure of 450,000 board-feet of illegal timber worth $180,000.
- USAID's environmental law enforcement working group supported efforts by the Philippines Supreme Court to set up and activate 14 special environmental courts to adjudicate specific environmental crimes.

These results demonstrate how better law enforcement and stronger community and individual property rights can provide the right mix of incentives to local governments, upland communities, and the private sector to act to preserve watersheds and rehabilitate denuded areas.

Total actual renewable water resources per capita (m^3/yr) (2006)	7,157
Proportion of renewable water resources withdrawn (2001)	30%

ined WRM techniques, including policies, regulations, technologies, and water management initiatives, at the local, state, and federal levels. Water conservation, land reclamation, supply-and- demand solutions to water scarcity issues, and cooperative efforts across state and international boundaries were among the topics and issues covered during their visit. In their follow-up reports, the participants said they received new information about water, environmental issues, and best practices that can be applied in Kazakhstan to forest rehabilitation and the development of national parks and ecotourism.

REGIONAL DEVELOPMENT MISSION/ASIA (RDMA)

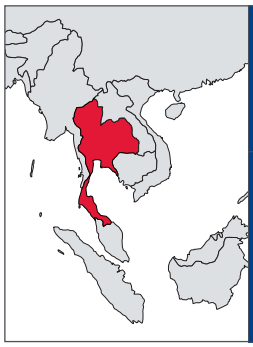
The WRM activities of RDMA are designed to "encourage reforms and increase the capacity of foreign governments to formulate and implement policies that expand access to safe water and sanitation in an affordable, equitable, and sustainable manner, including integrated strategic planning," as guided by U.S. Government policy stated in the Paul Simon Water for the Poor Act.

ECO-Asia

Through the ECO-Asia project, RDMA pursued WRM projects in China, Thailand, and Vietnam. ECO-Asia also conducted regional WRM activities in four Mekong River Basin countries – Cambodia, the Lao People's Democratic Republic (Lao PDR), Thailand, and Vietnam.

China: Over the past 20 years, demand for water in urban areas in China has been increasing by more than 7 percent per year. To meet growing demand, Jiangsu province is developing an improved water distribution system to better serve municipalities along the Yangtze River, in part by aggregating existing systems. The provincial government and the World Bank, which is supporting the project with a $150 million loan, wanted to ensure that the proposed system would match customer needs but did not have a methodology in place for assessing and evaluating user needs. Through the ECO-Asia project, USAID partnered with the province's Hohai University to design and conduct interviews with potential water users in four municipalities. Since many households already had access to water from a variety of sources, the survey determined the number of potential new users and whether they were willing and able to pay for the planned service. The surveys found that 81 percent of the households in the target areas favored access to an improved, more reliable water supply and were willing to pay for new services. Since the survey showed that not all consumers would sign up for the service, the province was able to tailor its project design and loan terms to better match user demand. As a next step, USAID and the province are developing a new participatory planning guideline for use by municipalities to facilitate civil society involvement in the design of municipal distribution networks.

Thailand: Many pig farms in Thailand are located near major bodies of water into which they directly discharge untreated pig waste and other agricultural runoff, significantly impacting the health and livelihoods of water users. The Bang Pakong River is one such waterway, and



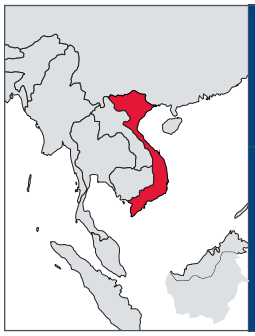
Total actual renewable water resources per capita (m^3/yr) (2006))	6,462
Proportion of renewable water resources withdrawn (2001)	21%

the runoff from 830 farms and nearly 700,000 pigs has severely polluted the river. To address this problem the USAID-supported Asian Environmental Compliance and Enforcement Network (AECEN) worked with Thailand's Pollution Control Department (PCD) to initiate a program for establishing centers that promote compliance with environmental regulations in the pig farming sector. The effort first focused on farms in the Bang Pakong River basin and also the Tha Chin River basin. PCD and AECEN organized workshops with pig farmers to get feedback on a model for the centers and provide outreach materials and training on agricultural best practices. AECEN also facilitated a peer exchange between PCD staff and a compliance assistance center in Taiwan. To help pilot a virtual compliance assistance center, AECEN provided support to Kasetsart University, a leader in the

The Lower Mekong River Basin extends from Thailand and Laos in the north to Cambodia and Vietnam in the south.

sector, to work with PCD to create a Web site, training materials, and a database of environmental requirements, regulations, and technologies targeting pig farmers in the two river basins. PCD also established two new policies on compliance assistance centers and trained more than 150 stakeholders. Demonstrating its commitment to the program, PCD allocated more than $500,000 over the next five years to develop four additional centers for the Chao Praya River (in 2009), Songkhla Lake (2010), Lam Ta Klong River (2011), and Ping River (2012). AECEN is using its success in Thailand to support a similar center addressing industrial pollution in West Bengal, India.

Vietnam: ECO-Asia initiated a partnership with Halong City to develop an intensive, hands-on training program for the 16 operators of the Bai Chay wastewater treatment plant. Halong City is the gateway to Halong Bay, a UNESCO World Heritage site with a spectacular



Total actual renewable water resources per capita (m^3/yr) (2006)	10,338
Proportion of renewable water resources withdrawn (2001)	8%

seascape of more than 1,600 islets and limestone pillars. To protect this natural resource and the tourism industry it supports, and also to reduce waterborne diseases, Halong City has improved its sanitation services by establishing sanitary landfills and, with World Bank financing, building the Bai Chay centralized wastewater treatment and interceptor sewer system. The city lacked trained operators, however, to efficiently operate and maintain the facility. After evaluating plant operator needs, USAID established a twinning partnership with Indah Water Konsortium, a Malaysian wastewater management corporation with extensive experience in the skills needed at Bai Chay. In addition to training plant operators, the partners developed a step-by-step approach to optimizing plant operations. To set user fees that enabled full cost recovery, the partners developed a system for determining actual operations and maintenance costs. These activities led to a 25 percent reduction in contaminants from the wastewater from the Bai Chay plant, and staff from Bai Chay will train operators and replicate operations and maintenance methods at a second treatment plant to be commissioned. In addition, ECO-Asia has transferred its training materials to the Vietnam Water Supply and Sewerage Association for dissemination to other Vietnamese cities.

Mekong River Basin: Rapid development in Asia has led to increased demands for water resources and, when resource allocations are made without adequate consideration of all upstream and downstream demands, given rise to potential transboundary conflicts. In the Lower Mekong River Basin, which is the world's largest freshwater fishery and where more than 48 million people depend on the river for their livelihoods, riparian countries have been constructing dams, irrigation dikes, and navigation waterways that significantly impact access to water resources for water supply and sanitation. Due to the unsustainable pace of the construction of dams and other development projects in the watershed, the fishery is under threat, with annual catches declining by up to 50 percent.

The countries of the Lower Mekong are challenged to find ways to work together to undertake development projects that promote economic prosperity while minimizing downstream impacts on river livelihoods and the environment. Policies and practices that enable participatory and collaborative engagement in planning activities that support sustainable development while mitigating and managing potential conflict and achieving equitable

access to water supply and sanitation are keys to meeting this challenge.

USAID/RDMA promotes regional water sector cooperation among the Lower Mekong countries. Through cooperation with the Mekong River Commission (MRC), RDMA worked with member countries Cambodia, Lao PDR, Thailand, and Vietnam on strengthening access to improved water services by managing conflict in the Mekong Basin. Regional cooperation on transboundary waters is now a core strategic goal of the MRC. With program partners, RDMA drafted recommendations for regional hydropower development, designed a collaborative decisionmaking process for addressing transboundary "hot spots" and critical issues, and trained more than 150 practitioners in conflict prevention and management. At a stakeholder consultation facilitated by USAID to develop recommendations for a sustainable hydropower program, more than 180 participants offered guidance for addressing the regional impacts of planned or proposed hydropower projects on riparian livelihoods. Other consultations outlined the MRC role in addressing country differences and disputes and helped stakeholders identify national needs.

USAID also developed a range of capacity building tools, including:

- An initial inventory of "hot spots" or critical issues (such as planned dams, threatened fisheries, and critical wetland areas) to heighten decisionmaker awareness and prioritize MRC and national resources

WRM SUCCESS STORY – ECO-Asia Philippines

Protecting the Country's Largest Lake With Virtual Compliance Centers

As the largest freshwater lake in the Philippines, Laguna de Bay is a vital natural resource in an area that is home to more than 10 million Filipinos. The Laguna Lake Development Authority (LLDA) oversees environmental protection of the lake and its watershed in coordination with 14 cities and 47 municipalities in Metro Manila and five provinces.

More than a decade ago, LLDA put in place a pollution charge system, a community participation initiative, and an enforcement program that has led to significant reduction in pollution loading in the watershed. Despite these innovations, environmental compliance still lags in some sectors, particularly among small- and medium-sized enterprises such as slaughterhouses and commercial pig farms. Of the 67 slaughterhouses monitored in 2006, fewer than half complied with environmental standards. Of 201 pig farms, only 26 percent complied.

LLDA PHOTO

Commercial fishing in Laguna de Bay is benefiting from increased environmental compliance by slaughterhouses and pig farms.

To reach these enterprises, LLDA decided to develop new mechanisms for raising awareness and understanding of environmental regulations and turned to the USAID-supported Asian Environmental Compliance and Enforcement Network (AECEN). By linking LLDA with the U.S. Environmental Protection Agency, AECEN exposed LLDA to U.S. experience with operating compliance assistance centers, including virtual centers on the Internet.

LLDA launched its own virtual compliance assistance centers targeting hog farms and slaughterhouses in April 2008. The centers provide up-to-date information on environmental policies, regulations, best practices, technologies, and financing. In addition, LLDA has trained more than 100 practitioners on compliance promotion and assistance; leveraged more than $13,000 of non-USAID funds; developed a manual to guide day-to-day operations; and enhanced coordination among concerned institutions, including government agencies, industry associations, and universities. As a next step, LLDA will establish physical compliance assistance centers, most likely in Rizal province.

- A glossary of conflict prevention and management terms and definitions in native languages and English to support effective dialogue

- A framework and guidelines for transboundary environmental impact assessments that provide new mechanisms for country cooperation in addressing potential developments throughout the Basin

With support from USAID, the MRC also adopted a new collaborative decisionmaking approach for building consensus in addressing critical transboundary areas in the watershed. USAID and MRC are applying the new approach at a pilot site on the border of Cambodia and Lao PDR, where unsustainable development is threatening the giant catfish and Irrawaddy dolphin. MRC countries chose the pilot project from a list of seven critical issues identified by USAID and the MRC. Stakeholders engaged in the pilot received special training on conflict management. The Lower Mekong countries will apply lessons learned from the pilot to the full range of transboundary issues.

MIDDLE EAST

Water scarcity is a cross-sectoral issue in the Middle East and North Africa. The region must contend with aridity and an acute shortage of renewable freshwater resources. Population growth and increasing demands for food, housing, and jobs place extreme pressure on water resources, thus engendering local and transnational disputes that exacerbate political tensions. Mitigating conflict and meeting demands require using existing renewable resources more efficiently.

Weak institutions and inadequate management compound the region's physical scarcity of water. Water management entities do not have clear roles and responsibilities, resulting in gaps or overlaps. The sector lacks a legal mandate to manage water comprehensively, and even when a proper water management framework is in place, organizations lack transparency and external accountability. Water agencies often function with inadequate data and forego mid- and long-term planning in favor of crisis management. Reforms are essential to ensure that decisions are followed up with resource allocation; that implementation is monitored; and that staff are trained, managed, and empowered to perform effectively. There is a critical need for a system to identify and highlight key features of a sound water governance framework and compare performance among countries in the Arab region.

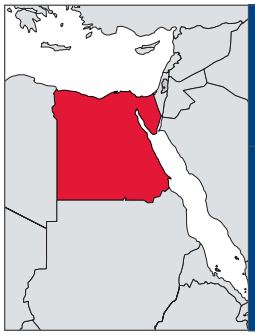
Egypt *(map and data next page)*

Egypt is a water-scarce country with an estimated water availability of 773 cubic meters per capita per year. This figure is expected to drop to approximately 534 cubic meters by 2025 and to less than 300 cubic meters in 50 years. Virtually all of Egypt's fresh water comes from the Nile River Basin. Rapid population growth, industrialization, and increasing use of agricultural inputs are all taxing the country's ability to deliver clean water to farmers, industries, and households. In 2005, the Ministry of Water Resources and Irrigation developed a national water resources policy based on integrated water resources management (IWRM) that is valid through 2017 and designed to address Egypt's water needs.

USAID/Egypt helped the Ministry decentralize its WRM activities through the establishment of integrated water management districts (IWMDs) and branch canal water users associations (BCWUAs) to increase water use efficiency and productivity. BCWUAs promote participatory approaches in all aspects of water management. They empower water users to better assess their needs and priorities, solve local conflicts and issues on their own, and partner with


USAID

Wastewater treatment plant stabilization pond, Egypt.



Total actual renewable water resources per capita (m^3/yr) (2006)	773
Proportion of renewable water resources withdrawn (2001)	95%

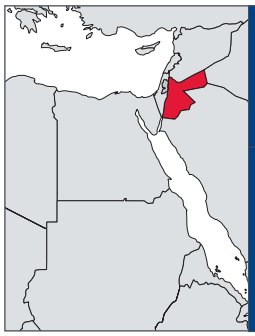
Ministry staff to solve larger issues. Applying the IWRM model for decentralized management required that districts be capable of preparing comprehensive IWRM plans. USAID supported a number of activities and procedures that enabled districts to do this, an achievement never before accomplished. The strong links between IWMD staff and BCWUA representatives also led to improved maintenance planning, reduced maintenance costs, better monitoring of water allocation, better conflict management, improved water quality through better control of solid and liquid waste disposal, and rapid response to water delivery problems.

Additionally, the formation of small-farmer BCWUAs involved a democratic election process with participation of all water users within a branch canal command area. The small-farmer BCWUAs empowered water users to assess their own community needs and priorities and solve local water disputes and issues. The goal of USAID with respect to the BCWUAs is to democratize the entire management process by empowering both water users and local managers.

An evaluation of Egypt's IWRM activities raised two issues affecting the sustainability of USAID's joint efforts with the Government – high staff turnover at the district level and the need for a revision to Law 12 of 1984 (Irrigation) that would give full legal standing to water users associations and allow them to raise funds from farmers and other sources.

Egypt is developing another four-year program (2008–2012) with the objectives of increasing water productivity and efficiency, improving quality, and ensuring equitable distribution among users. Planned activities include examining the feasibility of "corporatizing" regional water directorates as a means of reducing staff turnover, improving staff performance, promoting increased use of treated wastewater in agriculture, and developing public-private partnerships.

Jordan



Total actual renewable water resources per capita (m^3/yr) (2006)	164
Proportion of renewable water resources withdrawn (2001)	90%

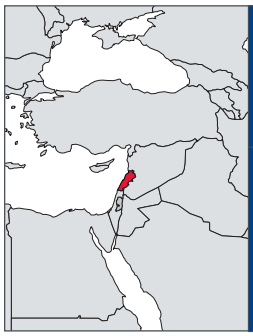
All of USAID's water resources and environment activities have a link to enhanced IWRM. Activity results contribute to the objectives of the Water for the Poor Act, and under the "key issue" of Watershed/Water Resources Management, focus on the number of people receiving improved service and the number of people trained in improved water management practices and approaches.

Water as a key issue is strongly aligned with host country goals. By engaging Jordanian civil society, hundreds of loans across the country were provided to save significant quantities of water. After diplomatic intervention by USAID, the King formed the Royal Water Committee, which has shaped a new national water strategy to focus on infrastructure while emphasizing water conservation and efficiency. Support for Amman's new water company helped reduce water loss, create awareness, and improve services to 2.1 million people.

USAID technical assistance also strengthened local capacity in water source protection, septage treatment, development of codes, waste management, and safe application of sludge to range and agricultural lands. More than 850 people received training in environmental management systems, environmental law, liquid industrial waste tracking, cleaner production, water use audits, wastewater reuse, watershed management, organic farming, composting, compliance and enforcement, and public participation.

Lebanon *(map and data next page)*

USAID assistance under program elements "Natural Resources and Biodiversity" and "Water Supply and Sanitation" addressed the problems of water pollution resulting from lack of sanitation systems, mostly in rural areas, and water scarcity caused by mismanagement of water resources. Assistance focused on protecting water quality through low-cost manageable solutions to water pollution that municipalities can duplicate and on developing



Total actual renewable water resources per capita (m^3/yr) (2006))	1,100
Proportion of renewable water resources withdrawn (2001)	ND

programs that improve the management and conservation of water through support to water organizations. In FY 2008, 23 community-level wastewater treatment plants, completed in 2007 and 2008, began operations, benefiting more than 250,000 people. USAID also supported the operation of a solid waste treatment facility and completed the construction of two larger wastewater treatment plants in the Litani River watershed. These facilities will benefit 32,000 people in five villages. By improving the value and quality of water resources critical to potable use, health, and economic growth, these activities addressed important factors for stability in Lebanon.

USAID helped the Lebanese Government address water demand management and reform laws governing domestic use and distribution of water. The aim is to improve water strategies, restore efficient use of water, and decrease water losses. Tools for efficient and sustainable water management were provided by strengthening organizations' capabilities, training their employees, introducing information technology systems, developing business planning, and implementing new tariff structures. By developing these tools, USAID is instigating changes in behavior and an understanding of water as a valuable, costly, and relatively scarce natural resource.

USAID also continued to support the South Lebanon Water Establishment (SLWE) to ensure the sustainability and proper use of the tools it developed. The program updated the SLWE business and financial plans and completed installation and operation of the financial accounting system. Extensive training accompanied SLWE's transition from manual operation to full automation, and SLWE will be Lebanon's first national water organization to complete this transition. A key problem, however, is the significant shortage of competent staff to operate the utility. To counter this problem, USAID provided substantial support for SLWE efforts to secure approval from the Ministry of Energy and Water (which had been freezing new recruitments) to hire 12 contract employees through a service contract with a local operator to handle the financial accounting system. This outsourcing contract, funded directly by SLWE, is an example of involving the private sector in water management that is applicable in well-defined areas and can contribute to solving major problems of Lebanon's water organizations. A total of 26 employees were trained in the financial accounting system, the financial cost recovery model, the geographic information system, and water meter reading, and 17 new jobs were created at SLWE.

OFFICE OF MIDDLE EAST REGIONAL PROGRAM

USAID's Office of Middle East Regional Program (OMEP) is implementing innovative regional water activities that aim to:

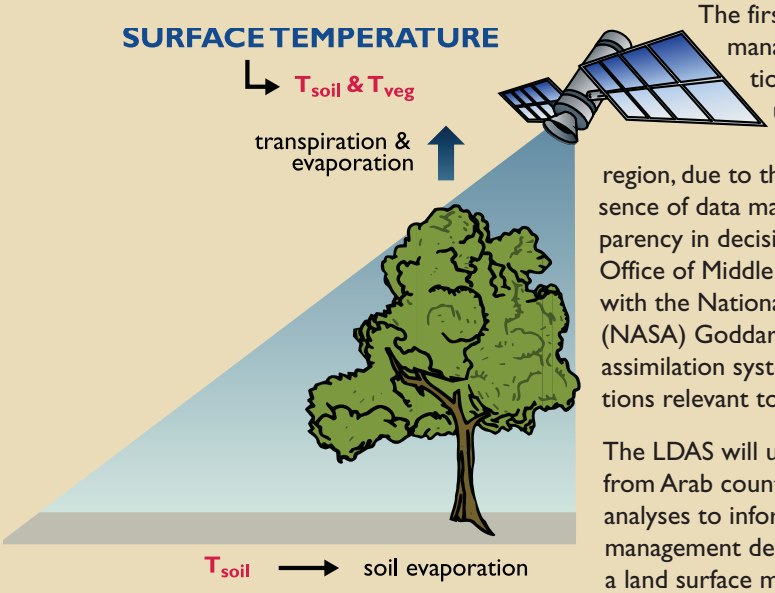
- Alleviate water conflicts
- Improve the performance and accountability of water management
- Increase access of the poor to safe water and basic sanitation services
- Support regional water platforms

Significant activities include the following:

Regional Water Governance Benchmarking

This recently funded activity aims to work collaboratively with other donors, regional water platforms, and governments to provide tools for comparing, guiding, and monitoring national progress on water governance in the Arab region. The contract will specifically: 1) develop a strategic framework that allows countries to assess their capacity to govern water resources effectively; 2) define a set of indicators that describe water governance and water service delivery capacity and performance; and 3) design guidelines for countries to define and monitor targets for water governance and water service delivery. The resulting benchmarking system will be helpful in the preparation and monitoring of national water master plans and strategies and promote a water management vision based on participation, equity, and sustainability. The water governance indicators will be regularly updated through annual reports such as the World Development Indicators of the World Bank or the corruption index from Transparency International.

Collaboration with NASA Monitors Middle East Water Conditions



Satellite at upper right monitors water conditions on Earth.

The first step for sound water decisionmaking and management is a proper understanding of the location, availability, quality, and current and future uses of water resources. Obtaining good water information remains a challenge in the Arab region, due to the costs of data collection and analysis, the absence of data management systems, and the lack of transparency in decisionmaking. To address this challenge, USAID's Office of Middle East Regional Program signed an agreement with the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center to develop a "land data assimilation system" (LDAS) to provide estimates of conditions relevant to water resources.

The LDAS will use NASA satellite data, surface observations from Arab countries, and publicly available meteorological analyses to inform water policymakers and improve water management decisionmaking processes. LDAS (also known as a land surface model) will generate a time series of map outputs describing the water cycle.

The system model will help meet the following WRM needs of countries in the region:

- Improve the ability of water managers to monitor changes in water availability, including surface and groundwater storage, river runoff, and related land use changes (vegetation, cropped areas), both retrospectively and potentially in near real time
- Serve as a tool for predicting the regional hydrological impacts of climate change scenarios
- Provide a platform for cooperation and data sharing among nations

Specific applications include coordinating the management of transboundary water resources, estimating the recharge rates of oversubscribed shared aquifers, and optimizing responses to droughts and floods on a regional scale.

The project focuses on the Middle East and North Africa region, primarily on Egypt, Jordan, Morocco, and Turkey. Neighboring countries such as Algeria, Tunisia, and Oman could be included as well. Three main tasks will be carried out:

- *Framework development* to describe the context of water resource development and management in any particular country. The framework will guide the choice of specific themes to be documented, analyzed, and benchmarked.

- *Policy, legal, and organizational assessments* to help countries identify strengths and weaknesses in their own policy, legal, and organizational WRM setups.

- *Benchmarking system definition and use* to evaluate individually and comparatively the national statuses of water-related legal, institutional, policy, and management environments, and guide efforts regarding water policy reform and water strategy design, implementation, and monitoring.

Advancing the Blue Revolution Initiative (ABRI)

OMEP is cofunding this initiative with USAID's Asia, Middle East, and Africa Bureaus. Launched in May 2007, ABRI aims to address the water challenges in the Middle East and Northern Africa region by providing a regional platform for sharing experiences, technical innovations, and expertise, and for improving cross-border cooperation. In 2008, collaboration was discussed with the Arab Countries Water Utilities Association and the Euphrates and Tigris Initiative for Cooperation, and activi-

ties such as transboundary aquifer management, water user participation, and a water valuation study were in planning or design stages. A future water leaders program identified about 25 promising midlevel water professionals from various Arab countries and different backgrounds (government, NGOs, private sector) and engaged them in training and networking activities.

Other regional activities to improve water management under consideration by OMEP include:

- Identifying transboundary water management activities that contribute to peace and reconciliation processes in the Jordan Valley
- Lobbying with the private sector to promote sound business practices related to water usage
- Using successful experiences (such as the Indian Business Alliance on Water) to raise awareness
- Identifying and assessing regional water platforms, such as the Arab Water Council
- Collaborating with and supporting reform-minded initiatives such as the Arab Water Academy (in coordination with the World Bank Institute)

EUROPE AND EURASIA

Armenia

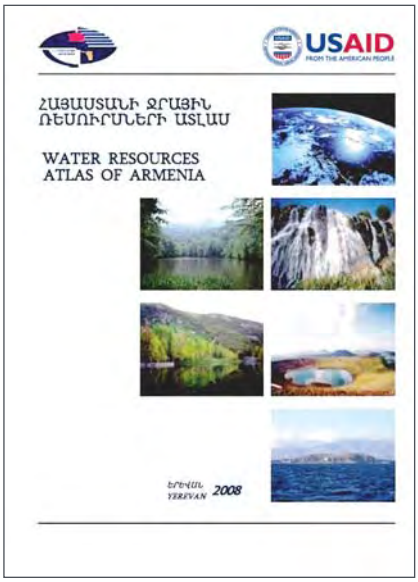
Total actual renewable water resources per capita (m^3/yr) (2006)	2,581
Proportion of renewable water resources withdrawn (2001)	36%

USAID's Program for Institutional and Regulatory Strengthening of Water Management in Armenia continued to assist the Water Resources Management Agency (WRMA) of the Ministry of Nature Protection with the technical design and construction of the State Water Cadastre Information System (SWCIS). The USAID program provides technical assistance, training, and equipment to improve WRM and the regulation of the increasingly decentralized irrigation and municipal water sectors.

WRMA is responsible for operating and maintaining the State Water Cadastre and has a significant role in IWRM. The Cadastre maintains comprehensive multiagency records on the quantity, quality, and composition of water resources; technical data on catchment areas and water intakes; water users; and water use, discharge, and system use permits. With USAID support, WRMA built SWCIS as an electronic tool for information management and data sharing. The system comprises eight tabular relational databases at stakeholder institutions and a central data warehouse and geographic information system (GIS)-based spatial component housed at WRMA. USAID helped in the development and enhancement of the spatial component of the data warehouse, which provides an opportunity for constructing GIS-based maps on water resources and water systems both at the national and basin levels. Over four years, more than 50 thematic maps were developed, providing a broad insight into the current status of water resources and systems as well as a general overview of the environment in Armenia.

To ensure interlinkages among the SWCIS databases, USAID also developed a national water network and resources coding system that assigns a unique identifier to every river, significant tributary, lake, and reservoir in the country, as well as to corresponding catchments and interbasins. After assessing several international methodologies, a coding system currently applied in EU countries was selected. WRMA is now using a comprehensive information management tool in IWRM planning and decisionmaking. The success of the project has prompted neighboring Georgia and Azerbaijan to adopt their own water resources coding systems, which will provide the foundation for regional South Caucasus water sector cooperation and information sharing.

USAID/Armenia's water program also published the *Water Resources Atlas of Armenia*, the first attempt to integrate all available water maps in one publication. The atlas complements the *National Atlas of Armenia* (2007) by emphasizing water resources-related issues and pressures and development trends in the water sector. The major cartographic sets include basin management areas and main river basins; a water objects coding system – rivers, lakes, and reservoirs; main groundwater aquifers; groundwater monitoring networks; surface water quality and quantity monitoring networks; water extraction



USAID/CAR

Water Resources Atlas of Armenia, *produced by USAID/Armenia.*

points; water user association service areas; irrigated areas; average annual precipitation zones; nature protectionareas and reserves; natural hazard zones such as seismic faults; and vegetation and soil zones. Multilayered maps were constructed at a scale of 1:250,000, which allows the maps to show the detailed features of five basin management areas. This planning and monitoring tool benefits all government agencies and ministries managing water supply, wastewater management, agriculture, and industry. It can be used by decisionmakers in the water sector and also by other countries in the region for planning and coordinating transboundary water issues.

Georgia

Total actual renewable water resources per capita (m^3/yr) (2006)	14,286
Proportion of renewable water resources withdrawn (2001)	3%

Watershed assessments were conducted and integrated natural resource management plans (INRMPs) were developed for areas where USAID-supported small hydropower plants were being installed. The assessments were instrumental in identifying potential problems, recommending mitigation measures, and ensuring long-term sustainability of the plants. During FY 2008, nine watershed assessments were completed and three of four INRMPs implemented. The military conflict with Russia in August delayed implementation of one INRMP.

Russia

USAID partner Civilian Research and Development Foundation (CRDF), with funding from USAID's Freedom Support Act account, the National Science Foundation, and the National Institute of Environmental Health Sciences, opened a climate change research competition, cofunded by the Russian Foundation for Basic Research (RFBR). This competition, which will provide grants to up to 15 joint U.S.-Russian teams, is open to researchers from all of the natural sciences who are studying the causes and effects of, or solutions to, climate change. As watershed and WRM issues are significantly related to global climate change, CRDF will contribute $40,000 per grant, and RFBR will contribute 900,000 rubles (approximately $35,000). In total, CRDF will provide up to $600,000 for this competition.

Total actual renewable water resources per capita (m^3/yr) (2006)	31,471
Proportion of renewable water resources withdrawn (2001)	2%

LATIN AMERICA AND THE CARIBBEAN

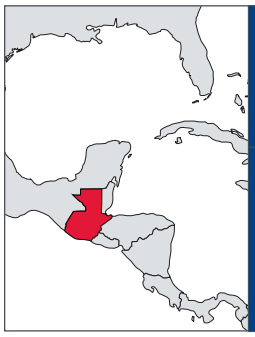
Ecuador *(map and data next page)*

In FY 2008, the USAID-supported Fund for the Protection of Water (FONAG) leveraged $2 million from the Inter-American Development Bank, the World Bank, the Eco-Fund, the French Institute for Development Research, the "Life for Quito" Corporation, and Quito's municipal water company to protect water basins that supply water to Quito and surrounding areas. A fraction of Quito's water fees are also assigned to FONAG. In ad-

Total actual renewable water resources per capita (m^3/yr) (2006)	32,147
Proportion of renewable water resources withdrawn (2001)	4%

dition, USAID supported the replication of this public-private conservation model in four new locations – Zamora, Tungurahua, Paute, and Loja – which quickly raised a $1 million endowment from hydroelectric companies, municipal water companies, and private foundations. As in Quito, these funds will be financed by a surcharge on water users. Initial protection activities in the 110,599 hectares of high-value watersheds included environmental education programs, park guard and community control systems, and conservation planning.

Guatemala

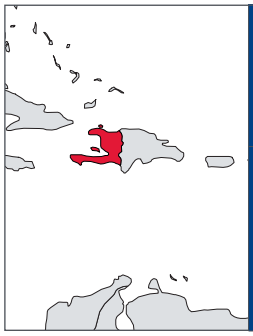


Total actual renewable water resources per capita (m^3/yr) (2006)	8,540
Proportion of renewable water resources withdrawn (2001)	2%

USAID provided technical assistance to rural small- and medium-scale enterprises, as well as to selected communities in northern Petén, the Verapaces region, and the western highlands, on best agricultural practices and sustainable forestry practices to prevent erosion- and sedimentation-related watershed degradation.

In accordance with the United States-Central America-Dominican Republic Free Trade Agreement, USAID continued to provide support to the Guatemalan ministries of environment and economy to ensure the reinforcement of wastewater and sludge management regulations in three industry sectors (textile, melons and other fruits, and vegetables). Exports to the United States from these three sectors have been growing very rapidly, but there is a high contaminant potential that needs to be addressed. USAID supported a rapid appraisal of a selected group of industries, carried out three case studies, and used the results to design a model of regulatory compliance that can be expanded to all industries. Also, judges, lawyers, and legal officials received training on legal penalties and implications of violations of the regulations. Although this activity was not completed as designed due to the change of government, the results are very useful for understanding wastewater and sludge management schemes in three key export industries. In addition, the training activities were also valuable experiences.

Haiti



Total actual renewable water resources per capita (m^3/yr) (2006)	1,485
Proportion of renewable water resources withdrawn (2001)	7%

In FY 2008, USAID began its watershed development program – Developpement Economique pour un Environnement Durable (DEED) – to promote economic development, hillside stabilization, and sustainable natural resource management in two of Haiti's vulnerable watersheds (Limbé and Montrouis). Increasing public and private investments in sustainable natural resource management and economic development is expected to increase environmental protection and economic development while reducing the environmental vulnerability that characterizes Haiti's watersheds.

DEED is a pilot program that uses a market-based approach to integrate sustainable management of natural resources with enterprise development and expanded job opportunities to improve the livelihoods of hillside farmers trapped in subsistence agriculture. In 2008, stakeholders and areas of collaboration were identified in both watershed sites. Discussions were initiated with the Chamber of Commerce of Cap-Haitien (Limbé area) about its potential to provide business development services to both producer groups and other service providers. The development of facilitators' services (including management, institutional development, agricultural extension, irrigation systems, commercialization, and GIS) has begun. Coastal hotels expressed interest in contracts for the supply of fruit and vegetables by producer groups. A grant manual was approved, and an annual program

DAI

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

statement issued to elicit applications for small grants designed to create sustainable economic development opportunities in the two watersheds. Several concept papers and proposals were submitted by local producer groups, mainly in the areas of sustainable production of high-value crops and agricultural intensification. Public-private partnerships were also under development in several areas, including tourism development, contract farming on private land, organic production of cacao, biofuel production, and centers for agricultural produce collection, conditioning, and distribution. DEED took important steps to strengthen the capacity of the watershed management committees to assume responsibility for planning and implementing DEED activities, with the ultimate goal of ensuring ownership of the interventions by local stakeholders. The participatory mapping of selected zones was completed. These maps identify land use patterns and will be the basis for land use plans and natural resource management at the subwatershed and microcatchment levels.

Panama

Total actual renewable water resources per capita (m^3/yr) (2006)	45,012
Proportion of renewable water resources withdrawn (2001)	1%

WRM and watershed management activities focused on three priority areas: 1) monitoring the water quality of the main rivers of the eastern region of the Panama Canal watershed; 2) promoting planning as a tool to ensure an orderly management of subwatersheds; and 3) strengthening local institutions as a way to improve local governance. USAID monitored water quality on a quarterly basis at 18 sampling sites in nine rivers of the Panama Canal watershed and in Soberania and Chagres National Parks, using an index of indicators of nine physical, chemical, and microbiological variables. The water quality values measured by the index at these sites were in the good range. The monitoring was developed in close collaboration with officials from the Environmental Quality Section of the National Environmental Authority. The goal is for the system and these new sites to be incorporated into regular ongoing monitoring activities by the Authority in 2009. Using a methodology adapted from the U.S. Environmental Protection Agency, seven participatory action plans were prepared for the subwatersheds where USAID works. The methodology merges water conservation objectives and community development values to develop the plans. These subwatersheds contribute close to 50 percent of the water resources needed to operate the Panama Canal and provide water for human consumption for half the national population.

USAID also established two watershed management councils (Chagres-Alhajuela and Transisthmian Corridor-Colon) for the seven subwatersheds (Chagres, Boqueron, Pequeni, Gatun, Limon, Gatuncillo, and Agua Sucia) through a participatory and integrative process. Community-based organizations, private sector groups, social organizations, and government entities present in the subwatersheds participated. This management model established a new way to share responsibilities for the sustainable management of critical watersheds, in which each public and private stakeholder, as well as the community, fulfills a specific role aimed at conservation and local development goals identified in the action plans for the subwatershed management.

WRM SUCCESS STORY – Mexico

Engaging Communities to Improve Wastewater Management

Rosario de Tesopaco is a poor rural community in northwest Mexico that has struggled to address its water sanitation needs for decades. Over the years, the community saw consultants come and go, leaving behind sanitation systems that were inappropriate for the area. These systems were ultimately abandoned due either to poor design or to the extensive technical knowledge needed to maintain them. The disrepair of the water sanitation systems left the community with areas of odor-filled raw sewage and health problems, including waterborne diseases.

Total actual renewable water resources per capita (m^3/yr) (2006)	4,340
Proportion of renewable water resources withdrawn (2001)	17%

The Universidad de Sonora–Michigan Technological University Partnership, funded by USAID/Mexico's Training, Internships, Exchanges, and Scholarships program and supported by Higher Education for Development, worked closely with the community to develop an effective plan to treat the wastewater. The university partners took a collaborative approach to tailor the project to the needs and capacity of the local community and positioned community members as leaders and owners of the project, a critical factor for its ultimate success and sustainability. Environmental engineers from the two universities surveyed local residents to assess community needs. These collaborations at the local level contributed to preferred design solutions. The partners also offered technical and management assistance to the community to facilitate maintenance at the local level.

A program-funded scholar worked with municipal officials to develop the community-based plan and was also instrumental in helping Rosario de Tesopaco obtain a $250,000 grant from Mexico's federal agency for social development to create a low-maintenance wetlands for wastewater treatment. The wetlands have been in operation since September 2006. This "green" solution not only effectively treats wastewater locally, without the bothersome smell for local residents, it also reduces health hazards and will eventually contribute to the creation of a natural habitat.

Interviews of local residents about their needs also helped identify and solve another environmental issue – the need for and creation of a local landfill. This spinoff project identified by partners has received funding support from the federal development agency – another example of how local, state, and federal officials in Mexico can work with communities to achieve good public health and environmental outcomes.

LATIN AMERICA AND CARIBBEAN REGIONAL PROGRAM

The Latin American and Caribbean region continues to experience a high rate of deforestation, resulting in increased soil degradation and sedimentation. These in turn cause stream clogging, deterioration of water quality, and an increased threat of flooding. Recent extreme fluctuations in river levels due to riparian deforestation, alongside growing urban populations with increasing demand for water, have led to widespread recognition of the need to better manage water resources in the southwestern Amazon. Protection of forest cover around rivers becomes crucial because forest cover helps maintain watersheds and moderate river levels. Deforestation is often concentrated in sub-basin watersheds that constitute important water sources for cities in the Andean Amazon. Partners in the regional Initiative for Conservation in the Andean Amazon (ICAA) worked to build greater local capacity and commitment for effective stewardship of key watersheds. Although the primary focus of the program is conserving biodiversity, ICAA partners recognize that improving watershed management not only will conserve riparian habitat for many species but will also improve water availability and water quality for local human populations. In FY 2008, ICAA partners worked to identify critical sub-basin watersheds with significant levels of deforestation. These watersheds will be the focus of future ICAA efforts.

CENTRAL PROGRAMS

Bureau for Economic Growth, Agriculture and Trade: Consultative Group on International Agricultural Research (CGIAR) – Water Management

Center for International Forestry (CIFOR): CIFOR implemented a new strategy with six objectives in 2008, one being the provision of environmental services from forests and water in particular. Policy research informed by real-world management of forests in Southeast Asia, Central Africa, and the Amazon Basin focused on increasing the value of forest resources and, within this objective, on forests as a source of water for a range of uses. Outputs include water quality and quantity improvements, both from managed forests and nonmanaged forests where logging occurs.

International Centre for Research in Agroforestry (ICRAF): Through its work in mixed forest/agricultural systems, ICRAF also engaged in forest-related watershed management activities aimed at increasing water storage capacity and increased reliability of environmental services.

Rewarding Upland Poor for Environmental Services (RUPES): Spanning Africa and Asia, the RUPES program reached many thousands of smallholders and used land tenure and land management practices and policies to foster the provision of clean water resources downstream, increased carbon sequestration, and enhanced biodiversity habitat.

In addition to the above programs, CGIAR focused on reducing the threat and severity of floods through improved watershed management, with a special interest in upland watershed management in eastern and southern Africa. Achievements also included improved water quality measurements in the Lake Victoria Basin.

Managing Coastal Resources through the SUCCESS Program

JAMES HUTCHINS

Working to maintain healthy coasts, as seen here in Tanzania, involves protecting terrestrial and coastal ecosystems.

In its fifth year, the USAID-funded Sustainable Coastal Communities and Ecosystems (SUCCESS) program continued to ensure that community-based demonstrations of successful natural resources governance are connected to supporting actions and policies at the provincial, national, and regional scales in diverse coastal locations throughout the developing world.

Highlights from 2008 included:

- **Tanzania:** In the biodiversity-rich waters of the Menai Bay Conservation Area on Tanzania's Zanzibar island, the program worked with local bivalve collectors (mostly women) to implement "no take" zones to address the overharvested and rapidly depleting bivalve population. The zones were formally established by the local district and endorsed by the Menai Bay Conservation Authority.

- **Ecuador:** In the Cojimies estuary and surrounding watershed, SUCCESS worked with local communities to conserve the estuary's remaining resources and biodiversity; restore what is possible to restore; and ensure that the estuary continues to provide food and income and to preserve biodiversity for today and tomorrow.

- **Nicaragua:** In the Estero Real Protected Area, where the majority of the nation's shrimp mariculture takes place, the program supported national-level adoption of a code of good practice for shrimp mariculture to reduce shrimp farming impacts on mangrove forests and ambient water quality. Water quality studies of local estuaries identified human health threats from contaminated seafood, highlighting the need to improve sanitary practices in rural coastal communities in order to protect estuarine water quality and human health.

At the regional level, SUCCESS established professional certification schemes that identify core competencies for managers and professional workers in coastal and marine protection specialty areas. The Western Indian Ocean Certification of Marine Protected Area Professionals Program, implemented by the Western Indian Ocean Marine Science Association based in Zanzibar, Tanzania, was endorsed and accredited by the International Union for the Conservation of Nature.

On the global scale, SUCCESS developed two important programming guides to assist USAID staff, implementing partners, and other donors – the *Coastal Climate Change Adaptation Guide*, which will help coastal communities address the chronic and increasing impacts of global climate change, and the *Sustainable Fisheries and Aquaculture Guide*, which will assist those seeking to reform small-scale fisheries and aquaculture.

III. Water Productivity Activities

© 2006 BEN BARBER, COURTESY OF PHOTOSHARE

Farmers irrigating their fields in a Nile Valley village in southern Egypt.

Economic activities ranging from agriculture and mining to industrial production require a dependable water supply. Food production is completely dependent on predictable and high-quality supplies of freshwater or healthy estuarine and marine waters. Approximately 80 percent of all human freshwater use in the world is devoted to agricultural production, often in irrigation systems that are inefficient and environmentally unsustainable. As industrial and commercial water consumption continues to increase, the tradeoffs between water allocations for domestic use, agriculture, industry, and ecosystem services will only intensify. Improving the productivity of available water is thus critically important for essential economic development.

The U.S. Government's water productivity (WP) improvement programs seek to maximize the efficient and productive use of water in industrial, agricultural, and other consumptive sectors, and to support pollution prevention programs and programs that reduce water losses. They focus predominantly on approaches that:

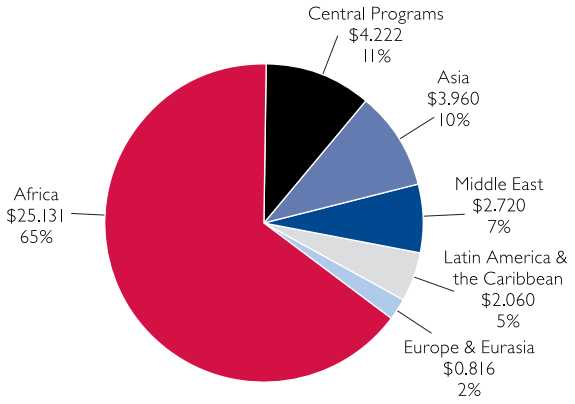
- Improve water use efficiency in agriculture
- Help countries adapt to hydrologic variability and climate change
- Reduce water pollution by industry
- Improve water use efficiency in cities

WP programs in the agriculture sector support efforts to improve agricultural productivity by emphasizing irrigation system efficiency. They work with public and private extension services to increase farmers' adoption of improved production technologies, systems, and appropriate crops for specific environments. Where appropriate, they also promote the reuse of treated wastewater for agriculture. With the growing expansion of aquaculture, WP programs also 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.

USAID's WP activities in 2008 included support for irrigation improvements, livestock water supply improvements, improved water-related agricultural soil and water management practices, aquaculture, and fisheries management. WP funding levels, which appear in the Foreign Assistance Framework primarily under the Agricultural Sector Capacity program element, were reported at $38.9 million and represented about 8 percent of the total water sector program funding of $489.6 million. Africa accounted for $25.1 million of the WP total (65 percent); Asia, $4 million (10 percent); and the Middle East, $2.7 million (7 percent).

Figure 14: Estimated USAID Water Productivity Obligations by Region, FY 2008 ($ Millions)

$38.9 Million, 8% of Total Water Obligations*



* FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.

USAID Project Supports Water Users Associations in Central Asia

JAMES HUTCHINS

The Water Users Association Support Project is bringing irrigation systems to beneficiaries in Kyrgyzstan, Tajikistan, and Uzbekistan.

The Water Users Association Support Project (WUASP) has been operating in the three Central Asian republics of Kyrgyzstan, Tajikistan, and Uzbekistan since 2004. Its objective is to create and strengthen water users associations (WUAs) so that farmers can operate, manage, and make the investment decisions needed to maintain and improve on-farm irrigation and drainage systems, resulting in more efficiently irrigated land, increased crop yields, less waste of natural resources, and economic benefits to farmers.

Key WUASP project components include:

- **Capacity building:** Through a series of training programs for WUA staff and members, WUAs develop the capacity to manage local water delivery systems using sound business practices and democratic principles.

- **Technical training:** WUAs implement improvements in technical practices and institutional management. Under this component, WUAs use limited in-kind support from WUASP (with costs shared with WUAs) to introduce advanced methods of on-farm irrigation infrastructure improvements and apply the knowledge gained from the training programs to manage their WUAs effectively. WUASP also provides training on higher-value crop production and processing for WUA members aimed at increasing farmers' net income.

- **Legal environment:** WUASP seeks to improve the legal and regulatory environment that will support the development of WUAs and their long-term sustainability.

- **Outreach/education:** A targeted outreach/communication program increases awareness of program benefits and improves the prospects of promoting institutional and legal reforms. The introduction of modern water and agricultural technologies is enhanced by effective communication to targeted groups of farmers, communities, politicians, and government personnel.

- **Counterparts:** WUASP works directly with ministries of agriculture and water resources, government food agencies, and local governments at the district and provincial levels.

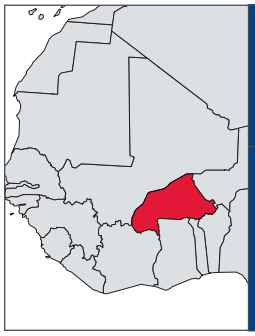
- **Beneficiaries:** WUA members are direct WUASP beneficiaries. Indirect beneficiaries include rural farmers, rural agricultural workers, and rural families who have access to irrigation water.

WUASP specifically provides WUAs with increased capacity to prepare and implement water distribution plans and schedules; prepare and manage annual budgets and finances; collect fees from members to cover services and operating costs; organize irrigation system rehabilitation and maintenance; mobilize labor and in-kind contributions from members; use transparent, democratic decisionmaking processes; and inform members about WUA issues and activities.

WUASP results for 2008 in Kyrgyzstan, Tajikistan, and Uzbekistan appear in the following pages under the separate entry for each country.

WP Activities by Country and Central Program

Burkina Faso

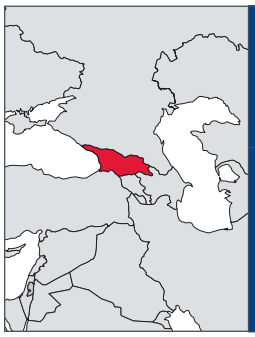


Irrigated area, 2003 (hectares)	30,000
Proportion of arable and permanent crop area irrigated, 2003	0.5%

Source for above statistics for Burkina Faso and other countries covered in this chapter: International Commission on Irrigation and Drainage.

The Africare project supported irrigation management of 30 hectares in Rassomdé through the installation of irrigation canals. The project also constructed 54 wells that will allow the irrigation of 12 additional hectares of irrigated small-market gardening perimeters. Additionally, 29 drinking water wells and four hand pump wells were constructed. To ensure good oversight of the new water points, 34 water resources management committees were formed and received training. The training also taught necessary management and hygiene skills.

Georgia

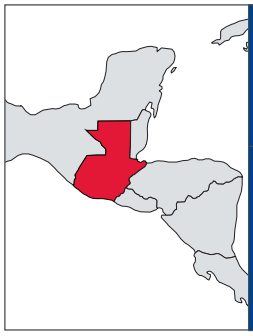


Irrigated area, 2003 (hectares)	ND
Proportion of arable and permanent crop area irrigated, 2003	ND

In FY 2008, USAID's WP programs in Georgia introduced sprinkle and drip irrigations systems and supported local farmers to irrigate more areas for agricultural production. USAID also developed activities to support the formation of associations and partnerships, which are essential if small and weak agribusinesses are to achieve economies of scale. Working closely with municipalities and local communities, USAID identified strategic areas for funding the rehabilitation of existing irrigation systems. New irrigation technology was introduced that brought an additional 1,370 hectares of farmland under irrigation. Once this irrigation water was available to targeted communities, USAID followed up with technical assistance, linking farmers to bank financing. USAID also supported WP improvement through the promotion of small hydropower plants and the formation of the basic regulatory, technical, financial, and operational building blocks for increased hydropower generation and efficient use of clean energy. FY 2008 technical assistance was directed at the rehabilitation of eight degraded hydropower facilities with approximately 8 megawatt potential.

USAID also achieved progress in the development of a water action plan for the Georgia Water Commission. The second of three reports, presenting financing, management, organizational, and technical constraints and options for the restructuring of 58 municipal water utilities, was prepared and presented to the Commission. The report generated consensus on the path forward, providing clear direction and expectations for the preparation and contents of the third and final report and action plan.

Guatemala



Irrigated area, 2003 (hectares)	ND
Proportion of arable and permanent crop area irrigated, 2003	ND

The Guatemalan Ministry of Agriculture received USAID support to evaluate its Watershed Management Unit, especially regarding how it coordinates its field activities with other Ministry units. The evaluation reviewed and evaluated the Unit's technical procedures, activities, and results. One of the main findings was that the Unit is the only Ministry unit that has direct contact with small farmers as an extension service. As a result, Pro-Rural, the Government's rural development program, became very interested in the Unit's operations and initiated and implemented plans to use the same strategy and field contacts for its activities.

In coordination with the Ministry and the Guatemalan Exporters Association, USAID supported the assessment

of hydrological resources in 10 departments of the Guatemalan highlands, the area with the highest potential for producing horticultural products. The purpose of the assessment was to determine the sources of water that would supply communities with enough water to allow them to increase crop productivity and agricultural exports from small-scale producers. From 100 identified potential sites, USAID financed the design of 10 small-scale irrigation projects for the Ministry to finance and implement. Designs are expected for another 10 small-scale irrigation projects in FY 2009.

Jordan

Irrigated area, 2003 (hectares)	80,000
Proportion of arable and permanent crop area irrigated, 2003	18.8%

Jordan is the fourth driest nation on earth, and enhancing the productivity of water is vital to meeting its development needs. Achievements in 2008 included training nearly 2,800 people in efficient water use and conservation. A new policy on water demand management was adopted; important studies on tariffs and subsidies were completed; and new agreements on municipal management of sanitation facilities, including promoting reuse of effluent, were forged. More than 500 small loans supported community initiatives to harvest water or use it more efficiently, benefiting 3,300 people.

MERCY CORPS

A farmer in Jordan inspects his tomato plants, which are flourishing under a newly installed drip irrigation system. The plants receive water through a tube buried directly beneath the plants, rather than through a less efficient open irrigation system, which floods much of the field and wastes water.

Kyrgyzstan

Irrigated area, 2003 (hectares)	1.07 million
Proportion of arable and permanent crop area irrigated, 2003	78.1%

During 2008, WUASP in Kyrgyzstan worked with 15 WUAs with nearly 22,600 members. Since the Project's inception in 2004, WUASP has worked with 24 WUAs, benefiting more than 29,000 members. There were nearly 156,000 indirect beneficiaries in 2008 (more than 187,000 since 2004). During 2008, more than 12,300 participants received training in democratic governance, business management, and water management (more than 21,500 since 2004, many times more than the original target of 1,420). WUASP conducted 233 separate training programs in 2008, with 666 conducted over the life of the Project.

In Karasuu district in Osh province, WUASP collaborated with the Joipas Water Users Association to improve its operations and rehabilitate an irrigation system bringing water to nearly 800 hectares of land. Previously, the association was poorly organized, and the water delivery system was nonfunctional. Farmers did not participate in decisionmaking, and water distribution lacked equity and transparency. Farmers used stones, silt, bags of sands, and pieces of rags to manage the water flow, and conflicts were frequent among neighbors who felt they were not receiving enough water for their fields. The association also chronically owed payments to the district water department, which would cut off water supply because of debts, resulting in poor harvests and very little income for farmers. To rehabilitate the irrigation system, USAID paid for heavy equipment and provided water meas-

WP SUCCESS STORY – WUASP Kyrgyzstan

WUA Becomes a Tool for Resolving Conflict

WINROCK INTERNATIONAL

A member of a Kyrgyz WUA at the water gates. The USAID-funded Water Users Association Support Program (WUASP) is helping this and many other associations across the country improve water management.

Farmer Salijan Saibidinov owns land alongside an irrigation canal in Shaidan village in Shaidan in Kyrgyzstan's Jalalabat province. Each spring, soon after the growing season began, his neighbors would throw trash onto his field while cleaning debris from the canal. His land also would flood when his neighbors overwatered their fields, affecting his crop yields. In turn, Salijan would reduce the amount of water flowing from the canal, thus causing resentment among his neighbors. Despite complaints by Salijan and other farmers, local authorities did not provide any solution. In a desperate attempt to resolve their endless conflicts, a group of farmers, including Salijan, approached their local WUA for help.

The WUA's newly elected council and conflict resolution commission persuaded the village rural council to move some of Salijan's land away from the canal, thus providing more space for the canal clean-up work without encroaching on his fields. The village council agreed and, because the land adjacent to Salijan's lot belonged to the state-owned Land Reallocation Fund, decided to swap some of Salijan's land closest to the canal with the same amount of land belonging to the Fund on the other side of his lot.

Now Salijan does not have to worry about flooding or debris polluting and destroying his crops, and he is able to achieve higher yields from his land. With more space for cleaning canal debris, clean-up efforts no longer cause tension among neighboring farmers.

With 500 members, the Shaidan-Kara-Ungur WUA is one of many in Kyrgyzstan created with the assistance of WUASP, which teaches participating farmers to manage their water resources, distribute irrigation water to various stakeholders in a transparent and fair manner, and resolve conflicts related to water systems and land rights.

urement and regulation devices, while the community supplied labor. WUASP also taught the association how to plan distribution so that all members receive water for their needs. The collaboration enabled the association to efficiently provide and regulate water delivery. Community disputes decreased, which made it easier for the association to collect fees and remain free of debt. Making advance payments to the water department ensured a steady water supply, and harvests improved, with an estimated 30 percent increase in wheat yield per hectare.

Other WUAs in Kyrgyzstan continued to provide benefits from ongoing WUASP-supported activities in flood control and bridge construction (Leilek district, Batken province); water- and cost-efficient gardening techniques (Nooken district, Jalalabat province); and conflict resolution (Shaidan district, Jalalabat province – see accompanying WP Success Story).

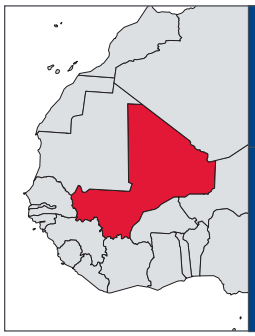
Malawi *(map and data next page)*

Through drama, dialogue, and agreements with the Department of Fisheries and beach village committees (BVCs), USAID helped improve the understanding of the role and function of participatory fisheries management. The Department agreed to assess the possible impacts of local fisheries regulations with a view to incorporating them, suitably modified, in the national fisheries conservation and management regulations. Fishing permit books were distributed to most BVCs around Lake Chilwa and some on Nkhotakota Lake, Lake

Irrigated area, 2003 (hectares)	60,000
Proportion of arable and permanent crop area irrigated, 2003	2.2%

Chikukutu, and the Bua River, and these BVCs began to issue permits. Dramas highlighting issues related to the role of BVCs and local regulations were performed for all 38 BVCs and river village committees in Nkhotakota district. To take pressure off the declining native fish stocks in Lake Malawi and Lake Chilwa, USAID promoted cage fish culture trials of native species that were managed by local BVCs and the Department of Fisheries. Initial feedback about the cage fish farming from the Department and the BVCs was very positive. USAID also supported the launch of the Malawi Gold Standard Aquaculture Production System, which showcased best practices for aquaculture.

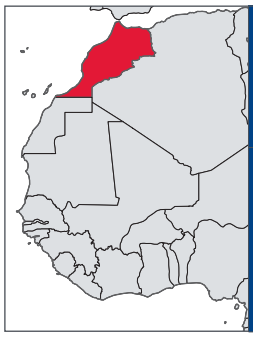
Mali



Irrigated area, 2003 (hectares)	240,000
Proportion of arable and permanent crop area irrigated, 2003	5.0%

Water productivity-related economic growth activities took place under Strategic Objective (SO) 1 (Increased Agricultural Production) of the Food for Peace food security initiative in Goundam. One of the SO's intermediate results is improved access to water for agriculture (microbarrages and wells). Impressive results in increasing cereal production came from perimeter-irrigated villages, which showed marked improvement in several factors, most notably concept and design of irrigation structures; concept, research, and diffusion of technological packages; community involvement in analyzing and finding solutions to technical problems; community organization and capacities; access to inputs and services required for reliable irrigated production; and garden vegetable production, mainly where pump irrigation is available.

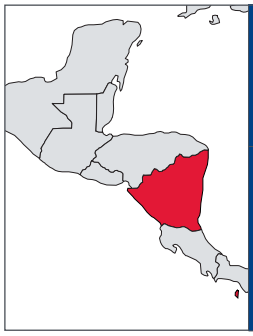
Morocco



Irrigated area, 2003 (hectares)	1.45 million
Proportion of arable and permanent crop area irrigated, 2003	15.4%

In Morocco, economic growth and social development take place in a water-constrained environment that is already showing signs of strain, especially in rural parts of the country where the poorest segments of society live and where agriculture constitutes the sole source of income. The U.S. Government helped the Ministry of Agriculture with policy decisions regarding efficient irrigation systems, especially in regions where water is very scarce. Activities also helped water users make more efficient use of water resources by shifting to higher-value added crops.

Nicaragua



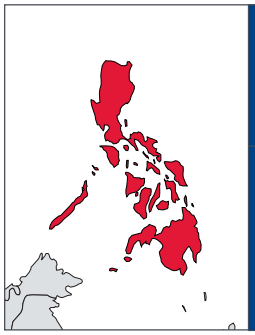
Irrigated area, 1999 (hectares)	2,746
Proportion of arable and permanent crop area irrigated, 1999	3.2%

USAID provided assistance to enhance the use of water for production in rural communities throughout Nicaragua. Nearly 5,900 farmers improved their production systems through the adoption of best practices in water conservation and soil conservation. These farmers improved their crop yields by using irrigation infrastructure and equipment provided through USAID assistance. More than 600 families improved their production by irrigating almost 64 hectares. Many farmers also captured water for productive purposes and established drip irrigation systems for producing high-demand, high-value crops.

This fisherman in the Philippines depends on diverse and abundant wild fisheries for his livelihood. Many of USAID's water programs work to restore and protect marine and coastal ecosystems while also ensuring sustainable fish harvests to local communities.

SEAN KILLIAN/CHEMONICS INTERNATIONAL

Philippines



Irrigated area, 2003 (hectares)	1.71 million
Proportion of arable and permanent crop area irrigated, 2003	16.0%

As an archipelago, the Philippines is an obvious candidate to harness water for productive uses. Its more than 25,000 kilometers of coast make fishing a major source of food and nutrition and a major economic driver in the country. Although threatened, the Philippines continues to have abundant sources of clean and potable water for domestic and commercial use. The full potential of these resources has not yet been fully utilized.

In 2008, two USAID projects placed more than 275,000 hectares of forests and coastal areas under improved natural resource management, and an ongoing fisheries project worked to conserve biological diversity in ecologically and economically important marine ecosystems, as measured by an increase in fish stocks and maintenance of coral reefs, sea grass, and mangroves that support fisheries with environmental services. The expected result is a seven-year increase in marine fish stocks by at least 10 percent from 2004 baselines in four areas – Calamianes in Palawan, Danajon in Bohol, and Tawi-Tawi and Surigao del Sur in Mindanao. By 2008, the project had developed 10 new marine protected areas (MPAs), covering approximately 900 hectares, which were expected to increase fish catches through restrictions on catch size, species, and timing. Multilevel integrated law enforcement promoted compliance, while intensive training, workshops, and information, education, and communication materials facilitated the adoption of the management measures. One MPA was established in Tawi-Tawi in an area popular with local fishermen. To ease their displacement to less fertile fishing grounds and possible loss of income during the early months of MPA operations, the fishermen were offered stipends for guarding the protected area. Within a year, however, fish catches in the new waters, and incomes, rose to levels higher than when the fishermen had earlier fished the protected area, thanks to increases in the number and types of fish being protected by the MPA.

Other USAID/Philippines WP activities included rural electrification projects that use water to generate electricity. One newly installed hydro facility provided power to remote and conflict-affected areas of Mindanao, areas that are considered uneconomical for power line extension by local electric cooperatives. The 35-kilowatt micro hydro system supplied electricity to approximately 215 households, two mosques, and one local community organization office in two villages. Project assessment identified a potential increase of 10 kilowatts that can still be realized in the future. Eventually, the system could provide energy for an additional 40 households as well as for productive uses, such as corn milling, coffee grinding and drying, and a bakery.

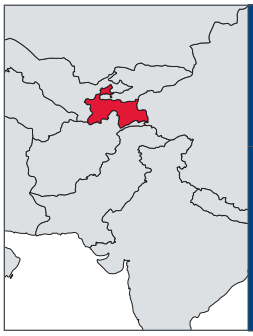
Tajikistan *(map and data next page)*

Unreliable and poorly managed irrigation and community water systems are widespread in Tajikistan. Limited resources for infrastructure maintenance, lack of technical and management skills, and farmer debt all contribute to the declining condition of the country's irrigation and drainage systems.

During 2008, WUASP in Tajikistan worked with 30 WUAs and one federation benefiting directly or indirectly

USAID/CAR

As a result of improved access to water, crops such as these grapes are plentiful and more profitable in Tajikistan.



Irrigated area, 2003 (hectares)	720,000
Proportion of arable and permanent crop area irrigated, 2003	68.1%

an estimated 227,000 people. About 2,800 participants received training in democratic governance, business management, and water management, bringing the total number trained since 2004 to about 9,300. The WUAs requested and received additional training and support to diversify production to high-value crops and to expand into agricultural processing and marketing. Five new WUAs are being organized that include about 320 WUA members, serve 600 hectares, and benefit some 35,000 people.

With training, improved water management, and technical improvements, the WUAs increased their investments in irrigation and drainage infrastructure to about $284,000. Over the life of the project, WUAs have invested more than $880,000. This significantly exceeded targets and is a major indicator of WUA sustainability. Over the life of the project, approximately $1.4 million has been invested in irrigation infrastructure rehabilitation.

In 2008, water management and delivery was improved for 30 WUAs, covering an area of more than 23,000 hectares (227,000 beneficiaries). Rehabilitation work included 30 distribution points, cleaning of 7.5 km of canals and 2 km of drains, and establishment of six offices. Since 2004, 177 distribution points have been rehabilitated; 2,900 meters of pipe/flume, 138 km of canals, and 106 km of drains cleaned; and 30 offices established.

Farmers participating in WUASP activities were able to significantly intensify the production of high-value crops, such as fruits, vegetables, and fodder crops. For example, for vegetables, the increase from 2006 to 2008 was about 200 percent, and for strawberry production it was about 55 percent. From 2004 to 2006, the increase in agricultural productivity led to an increase in net income for participating farm families of approximately $1 million. A 2008 economic analysis of a sample of 438 farmers showed that on-farm profitability of WUA members continued to increase as a result of WUASP. Net profitability of all crops combined for 2008 was $650 per hectare, an increase of about 10 percent from 2006.

Higher value crops continue to show great potential. Examples of net profitability per hectare included potato, $2,700; onion, $2,300; all vegetables, $2,300; cucumber and carrot, $2,900; tomato, $1,800; watermelon, $1,200; and corn, $550. WUASP continued to assist WUAs to establish contact with traders to market their crops both locally as well as for export.

Compared with 2006, wheat profitability increased about 80 percent from $300 to $545/hectare while cotton profitability decreased by nearly 300 percent. WUASP procured and delivered 600 tons of elite wheat seed from Russia and distributed 525 tons to WUA farmers and vulnerable villagers (11,000 beneficiaries). To convince farmers to invest in quality inputs to ensure better

WP SUCCESS STORY – WUASP Tajikistan

Gender Strategy Engages Women in WUAs and Other Activities

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In addition to water-related activities, the WUASP gender strategy in Tajikistan includes helping women bring products to market.

WUASP in Tajikistan has taken a special interest in increasing women's participation in water distribution and farm management. WUAs in Tajikistan are dominated by men, as the percentage of women managing farm units in Tajikistan is only about 10 percent (essentially the same as in the United States). This is changing slightly, however, as men emigrate to Russia and other countries to seek employment.

To promote women's involvement, WUASP introduced new programs concentrating on the agricultural production and irrigation of kitchen gardens and residential lands, which are traditionally managed by women. Improved productivity on these lands has a large potential to significantly impact family income and nutrition. WUASP also developed programs to address various aspects of fruit and vegetable production, such as new crops and better inputs and management. These programs will provide better nutrition and, if the products are sold in local markets, increased incomes.

As a result of Tajikistan's food shortage in the winter of 2007–2008, women members of WUAs also became interested in intensive training in food preservation to enable them to preserve safe food for use during the winter. To meet this need, WUASP engaged an experienced trainer and conducted 64 training sessions for about 1,200 women.

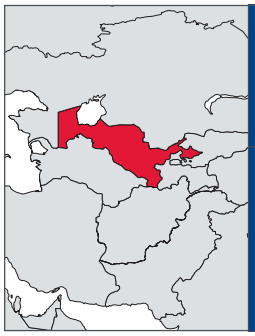
Other WUASP training in Tajikistan has covered topics such as women's rights, access to credit, and marketing issues. In FY 2008, about 1,800 women received training. These activities are part of WUASP's gender strategy to empower women to become more involved in water management and farming decisions, particularly at the community and household levels. Signs of the strategy's success to date have included:

- A threefold increase in women's participation in training courses since the beginning of the Project
- Increased role for women in managing WUAs, especially through the women's association in each WUA
- An NGO focusing on more vulnerable women in the WUA community
- Increased role for women in collecting fees from households that receive canal water
- Assistance for women in setting up market space to sell their products

production, the project trained 280 farmers in wheat growing and established five demonstration plots.

WUASP also responded to requests from other organizations for assistance in training and developing new 38 WUAs, with 24 completed or in process and 14 in the planning stage. One donor subproject was funded specifically based on WUASP success. The Tajikistan Government's commitment to WUASP was strong and fully supportive. The Ministry of Reclamation and Water Resources repeatedly requested WUASP and the U.S. Embassy to expand the program. Local governments cooperated with WUASP in various ways, such as donating land for WUA offices (with land titles transferred to the WUAs); arranging land for pump stations; providing access to utilities; arranging use of government facilities for meetings; and participating in special meetings with farmers upon request.

Uzbekistan



Irrigated area, 2003 (hectares)	4 28 million
Proportion of arable and permanent crop area irrigated, 2003	84.9%

WUASP cooperated with 30 WUAs in four provinces selected in cooperation with the Ministry of Agriculture and Water Resources and interested farmers. WUAs have more than 2,000 members and 237,000 indirect beneficiaries. Almost 10,000 participants received training in 2008 in democratic governance, business management, and water management, and the program has trained almost 30,000 people through almost 750 events since the program's inception in 2004.

WUASP-supported projects resulted in increased capacity to distribute water equitably and more efficiently. Most of the WUAs reported significant increases in agricultural productivity and net income because of improved water availability, despite dry year conditions. Water management and delivery were improved for more than 72,200

WP SUCCESS STORY – WUASP Uzbekistan

WUAs Begin to Extend Beyond First Four Provinces

The WUASP program in Uzbekistan has worked primarily in Samarkand, Namangan, Jizzakh, and Bukhara provinces, providing training on institutional development, financial management, business planning, and democratic governance, as well as technical assistance to renovate irrigation and drainage infrastructures and improve irrigation practices. As a result, WUAs in these provinces have been able to increase their irrigation service fee collection rates and improve irrigation management, which has led to an increase in agricultural productivity and farmer incomes.

These program activities positively changed farmers' perceptions of WUAs, and these perceptions have begun to extend beyond these four provinces as farmers in other areas began to see the benefits of WUAs. In February 2008, at the request of the Ministry of Agriculture and Water Resources of Karakaplakstan, WUASP specialists conducted a training program in Amudarya district on sustainable development of WUAs. More than 60 people, including WUA managers, farmers, the local mayor, and Ministry representatives, attended. The training covered best practices, financial management, organizational development, and record keeping. Training participants received materials and books published by WUASP and had the opportunity to ask WUASP specialists questions on WUA development. WUA representatives who participated invited WUASP specialists to conduct similar training programs for farmers in their associations.

WINROCK INTERNATIONAL

The USAID-funded Water Users Associations Support Program in Uzbekistan has enabled this couple to once again use all their land for farming.

During the fall, the Ministry organized a series of cross visits and province-level seminars designed to highlight WUA development. The WUASP-supported WUAs in Jizzakh, Namangan, and Samarkand were asked to host the seminars and serve as replication models for other associations. During the events, host WUA representatives spoke to participants about their WUA activities, achievements, and the role of the USAID program in their associations' development and long-term sustainability. The representatives stressed the importance of record keeping and sound financial management practice. Participants visited water engineering objects constructed and rehabilitated with the WUASP and heavy equipment provided by USAID. With more than 200 WUAs in attendance, the seminars provided an opportunity for farmers to discuss challenges, brainstorm solutions, and share success stories.

USAID

WUA member in Tajikistan displays fruits of his labor.

hectares, resulting in reduced conflict over delivery and scheduling.

Farmers participating in WUASP activities were able to intensify production of high-value crops such as grapes, strawberries, onions, potatoes, and persimmons. The area under cotton cultivation declined from just over 52 percent of total crop area in 2007 to less than 43 percent in 2008. High-value crop area increased by 5 percent from last year. Overall gross income of farmers from all cooperating WUAs increased from approximately $1,683 per hectare in 2007 to $1,909 in 2008 (13 percent), due to increased investments in the irrigation and drainage infrastructure. WUA irrigation service fee collections increased from $114,698 from January to September 2007 to $169,161 over the same period in 2008 (47 percent). WUA budgets for 2008 increased from $303,316 in 2007 to $398,148 (31 percent).

In June, three WUAs in Bukhara province's Jondor district united their resources to clean 1,200 meters of the Dalmun canal. Irrigation canals should be cleaned frequently to avoid the buildup of silted water, but for many years the Dalmun canal was not properly cleaned due to lack of resources and poor cooperation among farmers. The condition of the canal impacted irrigation water delivery and the well-being of the surrounding communities, which could not get enough water to grow fruits and vegetables, which they had to purchase from the market. The three WUAs began working with WUASP in 2005, and part of their training focused on the benefits of community mobilization and the importance of cooperative problem solving. With USAID providing heavy equipment, the WUAs worked together and rehabilitated the canal to provide water in a timely manner and in the required amounts to 406 hectares, including 60 backyard gardens and 10 farms. Four communities (844 families, 3,000 people) benefited from the new high-value fruit and vegetable crops they were able to grow.

Continuing an initiative that started in 2007, WUASP extended a grant to enable a WUA-supported sewing workshop and business to expand. In order to support women's participation in the Kanal Suv Yuli WUA in Zomin district of Jizzakh province, WUASP in 2007 helped local residents organize a women's committee to address problems faced by rural women. WUASP specialists conducted a number of meetings and training programs for the committee and WUA staff and members, explaining the main approaches to and principles of supporting women's initiatives and improving their living conditions. Three women WUA members then organized a sewing workshop in June and, with assistance from the WUA, rented a room where professional tailors operated three sewing machines. By October, the enterprise had 10 employees, including seven women who were previously unemployed. In 2008, the activity received additional grant money to expand and buy additional equipment, and it continued to grow in popularity and productivity. Participants and the community benefited from job creation, skills development, support for small business, and the satisfaction of the people's demand for the sewing products. The program has the potential to benefit the WUA as an additional source of income if it becomes financially sustainable.

Other communities in Uzbekistan continued to benefit from ongoing WUA activities in new crop-growing technologies (Pop district, Namangan province); drainage ditch clearance and pump-free irrigation canals (Jondor

district, Bukhara province); construction of new water distribution points and other water structures (Samarkand province); and food production and processing (Bukhara, Namangan, and Samarkand provinces).

CENTRAL PROGRAMS

Bureau for Economic Growth, Agriculture and Trade: Consultative Group on International Agricultural Research (CGIAR) – Water Productivity

Agricultural water resource management: In semi-arid regions in particular, CGIAR centers focused on reconciling competing needs for water at the household, village, and field levels. Both the International Center for Agricultural Research in Dry Areas (ICARDA) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) worked on small-scale catchments that allow both increased access to clean water as well as greater resilience in productive enterprises at the household level. Water use efficiency is a major focus of ICARDA. Working in some of the driest areas of the Middle East, ICARDA expanded its efforts on "gray" water management that will both improve agricultural productivity and protect and conserve limited drinking water supplies. Water harvest and conservation of hillside systems are the main areas of emphasis in the upper Nile Valley and Yemen, with major emphasis on reducing erosion and improving water quality downstream.

Multi-use water resource management: The International Water Management Institute (IWMI), CGIAR's lead water institute, has laid out an ambitious goal to work toward increasing water use efficiency by 25 percent. In 2008, IWMI implemented a comprehensive research approach that looked at hydrological water balances and management in key basins, such as the upper Blue Nile. Taking into account both expanding needs and the probable impacts of climate change, key policy approaches and goals were developed. IWMI took a similar approach in Northeast India, a water-surplus region in a country facing increasing competition for limited resources. Drinking water studies were carried out that directly link enhanced irrigation system management with greater availability of clean drinking water in large regions of South Asia, where villages rely on groundwater, as well as in the Yellow River basin of China. Ominously, water extraction has peaked in several regions of South Asia, adding urgency to the development and application of both technical and governance approaches to sustainable management of the resource. IWMI is extensively engaged with partners across Asia on this issue.

A major research focus in 2008 was the management of smaller-scale, multi-use water supply systems in Africa and Asia, with programs under way in South Africa, Morocco, Pakistan, Sri Lanka, and Ghana. The focus of the research was on investment and management strategies that reconcile agricultural, drinking water, and other needs. By increasing explicit attention to household needs, especially those of the poor, IWMI fostered much broader attention to water poverty and cost-effective approaches to ensuring that smaller communities and rural areas are not bypassed in investment strategies. Emphasizing capacity building at both the human and institutional levels, IWMI worked in both new system development and water system rehabilitation and developed governance reform packages that can be adapted to local needs. Technologies include seepage tapping, POU water treatment, and special access for livestock that keeps drinking water pure.

Bureau for Economic Growth, Agriculture and Trade: Collaborative Research Support Program (CRSP)

Agriculture, Aquaculture, and Fisheries CRSP: The total FY 2008 funding was $3.16 million, all of which was attributed to the WP key subissue. The program's goal is to develop more comprehensive, sustainable, economically viable, and ecologically and socially compatible aquaculture systems through research, training, outreach, and capacity building activities. Current projects include:

- Cost-Effectiveness and Sustainability of Aquaculture in the Philippines and Indonesia
- Improving Sustainability and Reducing Environmental Impacts of Aquaculture Systems in China and South and Southeast Asia (Nepal, Vietnam, China)
- Developing Sustainable Aquaculture for Coastal and Tilapia Systems in the Americas (Guyana, Mexico)
- Human Health and Aquaculture: Health Benefits through Aquaculture Sanitation and Best Management Practices (Nicaragua, Mexico)
- Development of Alternatives to the Use of Freshwater Low-Value Fish for Aquaculture in the Lower Mekong Basin of Cambodia and Vietnam: Implications for Livelihoods, Production and Markets (Cambodia, Vietnam)

- Improving Competitiveness of African Aquaculture through Capacity Building, Improved Technology, and Management of Supply Chain and Natural Resources (Kenya, Tanzania, Ghana)

Sustainable Agriculture and Natural Resources Management (SANREM) CRSP: The total FY 2008 funding was $2,174,406, of which $450,000 was attributed to the Watershed/Water Resources Management key subissue. SANREM's objective is to support sustainable agriculture and natural resource management decisionmakers in developing countries by providing access to appropriate data, knowledge, tools, and methods of analysis, and by enhancing their capacity to make better decisions to improve livelihoods and the sustainability of natural resources. Current projects include:

- Decentralization Reforms and Property Rights: Potentials and Puzzles for Forest Sustainability and Livelihoods (Bolivia, Mexico, Kenya, Uganda)

- Developing a Participatory Socio-Economic Model for Food Security, Improved Rural Livelihoods, Watershed Management and Biodiversity Conservation in Southern Africa (Zambia)

- Watershed-Based Natural Resources Management in Small-Scale Agriculture: Sloped Areas of the Andean Region (Bolivia, Ecuador)

- Adapting to Change in the Andean Highlands: Practices and Strategies to Address Climate and Market Risks in Vulnerable Agro-Ecosystems (Bolivia, Peru)

- Agroforestry and Sustainable Vegetable Production in Southeast Asian Watersheds (Indonesia, Philippines, Vietnam)

Global Livestock CRSP: Total FY 2008 funding was $2.5 million, of which $191,000 was attributed to the Watershed/Water Resources Management key subissue. Rapid land cover and land use changes occurring in Kenya's Rift Valley are altering the hydrologic response in the Njoro River watershed. This watershed is a critical contributor of runoff to Lake Nakuru National Park, an internationally recognized wetlands area. Three remote sensing images were classified to determine the land cover transitions that occurred over a 17-year period during the 1980s and '90s. The results served as the primary land cover data set for surface runoff simulation using the Automated Geospatial Watershed Assessment (AGWA) tool. AGWA was used to generate parameter input files for the Soil and Water Assessment Tool (SWAT), a hydrologic model suitable for assessing land cover change impacts on hydrologic response. The SWAT findings showed that changes have resulted in corresponding increases in surface runoff and changes in the timing and intensity of runoff. Increases in surface runoff and changes to water yield show a high degree of spatial and temporal heterogeneity that are linked to land cover and land use changes. Such modeling serves an important role because the time, cost, and expertise required to install, monitor, and identify problems in the field using hydrological instrumentation can be prohibitive and because lessons learned from modeling can be transferred to similar environments.

IV. Disaster Risk Reduction Activities

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Drought is one of the natural disasters that USAID confronts most often.

USAID/KRISTEN KELLEHER

These Indian girls, displaced by the 2004 tsunami, learn the importance of washing their hands in a temporary settlement in southern India. Reconstruction is an opportunity to improve water pumps and latrines, raise people's standard of living, and encourage good hygiene.

Intensive wind storms (hurricanes, typhoons, and cyclones), floods, tsunamis, and droughts often lead to the loss of many thousands of lives and economic losses of billions of dollars. The Hyogo Framework for Action, an overall guiding framework for the International Strategy for Disaster Reduction, calls for the development and strengthening of institutions, mechanisms, and capacities to build resilience to hazards. Identifying, monitoring, understanding, and forecasting hydrometeorological hazards are critical first steps for developing plans, strategies, and policies, and for implementing disaster risk reduction (DRR) measures.

The USAID Office of U.S. Foreign Disaster Assistance (OFDA) works closely with communities, national and local governments, international and regional organizations, and NGOs to identify, manage, and strengthen capacity at all levels to increase resilience to climate-, weather-, and water-induced disasters. Hydrometeorological DRR activities have strong linkages to the management of natural resources, including water, and seek to build resilience to better enable countries and communities to prepare for and cope with serious events when they occur. USAID/OFDA supported slightly more than $2.2 million for hydrometeorological risk reduction activities in FY 2008.[5]

OFDA Hydrometeorological DRR Activities

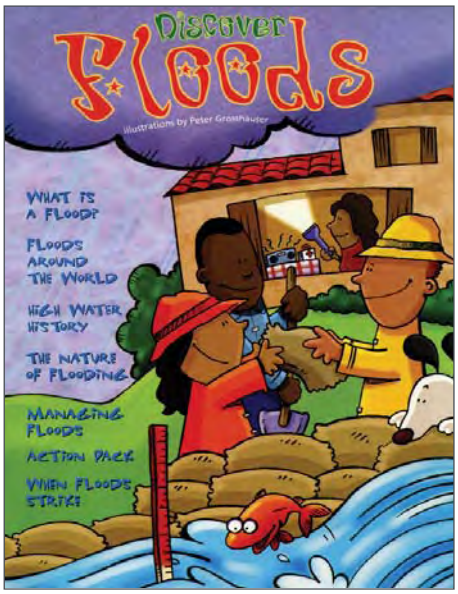
During the last decade, hydrometeorological disasters such as floods, droughts, and cyclones claimed more than 630,000 lives (62 percent of total fatalities due to natural disasters), affected about 2.8 billion people (98 percent of total population affected by natural disasters), and were estimated to cost more than $800 billion (84 percent of total estimated damages from natural disasters).[6] Extreme weather and climate events often have significant impacts, including loss of livelihoods, destruction of shelters, destruction of important fragile ecosystems, damages to infrastructure systems (energy and power, sanitation, transportation, etc.), health and social service disruptions, migrations, conflicts, and scarcities of food and water. The direct and indirect impacts of disasters can increase the vulnerability of affected populations to natural hazards and may set back economic development due to the costs of response and rehabilitation.

Hydrometeorological risk reduction activities are aimed at reducing vulnerability to these hazards through an integrated multisectoral approach that addresses the needs of populations while emphasizing capacity building and locally sustainable and environmentally sensitive measures. In FY 2008, OFDA continued to support flood- and drought-related early warning, preparedness, and mitigation activities, including:

- Implementation of flood forecasting in transboundary rivers in Asia (Mekong and Ganges-Brahmaputra-Meghna River Basins)
- Drought monitoring, climate prediction, and mitigation in Eastern Africa
- Global flood hazard mapping
- Dissemination of hydrometeorological information to end users and populations in remote areas using the Radio and Internet Technologies for the Communication of Weather and Climate Information for Rural Development Program (RANET) system in Africa and the Asia-Pacific region

[5] By comparison, WSSH-related disaster response activities received $91.4 million under International Disaster Assistance.

[6] World Disaster Report, International Federation of Red Cross and Red Crescent Societies, 2008.



Education materials on floods for children.

- Community-based flood and drought management activities in Asia and Africa
- Global flash flood guidance system
- Technical assistance provided on a global level

Hydrometeorological DRR activities in 2008 included:

Strengthening Hydrometeorological Early Warning Capacity: In Asia and Africa, OFDA aims to strengthen the capacity of national hydrometeorological institutions in climate, weather, and hydrological monitoring, forecasting, and warning, with a focus on the efficient application of information that will reduce loss of life, lessen socioeconomic impacts, and improve natural resources management. In 2008, OFDA initiated a global program to develop a flash flood guidance system in support of hydrometeorological services around the world to reduce vulnerability to flash floods. The program is being implemented in partnership with the World Meteorological Organization (WMO) and national meteorological and hydrological services.

Dissemination of Hydrometeorological Information to People at Risk: OFDA and the National Oceanic and Atmospheric Administration supported RANET, which was developed to improve access to hydrometeorological information to aid day-to-day resource decisions at the community level while improving overall resiliency to natural hazards. In Africa and the Asia-Pacific region, RANET enables populations in remote areas to access climate, weather, and other relevant information, such as agriculture- and health-related information. RANET continues to be the only global communication medium to disseminate tsunami alerts and notification summaries to national emergency managers and other key officials in tsunami-prone areas.

Preparing Communities to Take Action and Make Intelligent Decisions: Flash floods are rapid-onset events that are difficult to predict and occur within hours. OFDA supported a community-based flash flood management project in the Hindu Kush–Himalayan region to strengthen capacities of communities in managing the risk of these hazards. In partnership with WMO and Project WET, a worldwide water education project, OFDA also supported the development of education materials on floods for children in the 8- to 12-year age group.

Appendix: Tables 10–13

Table 10: Allocations from Foreign Assistance Accounts to Meet the 2008 Statutory Requirement on Water Supply, Sanitation, and Hygiene Activities by Operating Unit and Funding Account ($ Millions)*

*** FY 2008 budget data represent best estimates from USAID analysis of information as of March 2009.**

	Total	DA	CSH	ESF	AEECA	IDA	GHAI
TOTAL	**296.650****	**126.796**	**33.900**	**83.343**	**6.030**	**33.103**	**12.478**
Africa	**108.252**	**52.084**	**13.500**	**15.200**	**0.000**	**15.000**	**12.468**
Angola	1.000	1.000	-	-	-	-	-
Benin	0.250	-	0.250	-	-	-	-
Botswana	0.200	-	-	-	-	-	0.200
Burundi	1.050	1.000	0.050	-	-	-	-
Cote d'Ivoire	0.927	-	-	-	-	-	0.927
Democratic Republic of the Congo	4.250	3.000	1.250	-	-	-	-
Ethiopia	4.630	1.650	1.100	-	-	-	1.880
Ghana	2.300	2.000	0.300	-	-	-	-
Kenya	6.125	4.000	1.000	-	-	-	1.125
Liberia	2.650	2.500	0.150	-	-	-	-
Madagascar	2.969	2.269	0.700	-	-	-	-
Malawi	0.306	-	0.300	-	-	-	0.006
Mali	0.700	0.500	0.200	-	-	-	-
Mozambique	5.814	2.000	0.600	-	-	-	3.214
Namibia	0.343	-	-	-	-	-	0.343
Nigeria	3.855	2.000	0.150	-	-	-	1.705
Rwanda	0.800	0.100	0.300	-	-	-	0.400
Senegal	2.200	2.000	0.200	-	-	-	-
Somalia	2.500	2.000	0.500	-	-	-	-
South Africa	0.990	-	-	-	-	-	0.990
Sudan	16.140	6.000	4.940	5.200	-	-	-
Tanzania	3.145	3.000	-	-	-	-	0.145
Uganda	3.778	2.000	0.250	-	-	-	1.528
Zambia	2.905	2.000	0.900	-	-	-	0.005
Africa Regional - USAID	7.425	7.065	0.360	-	-	-	-
East Africa Regional	1.000	1.000	-	-	-	-	-
Southern Africa Regional	2.000	2.000	-	-	-	-	-
West Africa Regional	3.000	3.000	-	-	-	-	-
Attributions	25.000	-	-	10.000	-	15.000	-
Asia	**74.988**	**54.864**	**12.700**	**7.424**	**0.000**	**0.000**	**0.000**
Afghanistan	18.399	11.894	2.000	4.505	-	-	-
Bangladesh	5.900	4.400	1.500	-	-	-	-
Cambodia	5.350	4.000	1.350	-	-	-	-
India	4.000	3.000	1.000	-	-	-	-
Indonesia	16.850	12.500	4.350	-	-	-	-
Pakistan	7.100	2.950	2.500	1.650	-	-	-
Philippines	1.519	0.250	-	1.269	-	-	-
Timor-Leste	5.000	5.000	-	-	-	-	-
USAID Regional Development Mission-Asia (RDM/A)	7.700	7.700	-	-	-	-	-
Asia and Near East Regional	3.170	3.170	-	-	-	-	-

Table 10 continues on the next page.

Table 10 (cont.): Allocations from Foreign Assistance Accounts to Meet the 2008 Statutory Requirement on Water Supply, Sanitation, and Hygiene Activities by Operating Unit and Funding Account ($ Millions)*							
* FY 2008 budget data represent best estimates from USAID analysis of information as of March 2009.							
	Total	**DA**	**CSH**	**ESF**	**AEECA**	**IDA**	**GHAI**
TOTAL	**296.650****	**126.796**	**33.900**	**83.343**	**6.030**	**33.103**	**12.478**
Middle East	57.000	0.000	0.000	57.000	0.000	0.000	0.000
Egypt	1.300	-	-	1.300	-	-	-
Jordan	41.000	-	-	41.000	-	-	-
Lebanon	8.000	-	-	8.000	-	-	-
West Bank and Gaza	5.700	-	-	5.700	-	-	-
State Near East Regional (MEPI)	1.000	-	-	1.000	-	-	-
Unallocated	18.103	0.000	0.000	1.000	0.000	18.103	0.000
Unallocated	18.103	0.000	0.000	0.000	0.000	18.103	0.000
Latin America & the Caribbean	16.491	10.762	2.500	3.219	0.000	0.000	0.010
Bolivia	3.000	3.000	-	-	-	-	-
Dominican Republic	2.200	2.200	-	-	-	-	-
Ecuador	5.794	3.000	2.000	0.794	-	-	-
Haiti	3.497	0.562	0.500	2.425	-	-	0.010
Mexico	1.000	1.000	-	-	-	-	-
Nicaragua	1.000	1.000	-	-	-	-	-
Central Programs	14.286	9.086	5.200	0.000	0.000	0.000	0.000
Economic Growth, Agriculture & Trade (EGAT)	9.086	9.086	-	-	-	-	-
Global Health (GH)	5.200	-	5.200	-	-	-	-
Europe & Eurasia	6.030	0.000	0.000	0.000	6.030	0.000	0.000
Armenia	1.000	-	-	-	1.000	-	-
Georgia	0.530	-	-	-	0.530	-	-
Kosovo	4.500	-	-	-	4.500	-	-
Oceans & Int'l Environment & Scientific Affairs (OES)	0.500	0.000	0.000	0.500	0.000	0.000	0.000
Oceans & Int'l Environment & Scientific Affairs (OES)	0.500	-	-	0.500	-	-	-

** This amount represents the $300 million FY 2008 water earmark, minus rescission and reduction to address food security.

ACRONYMS: DA = Development Assistance; CSH = Child Survival and Health Fund; ESF = Economic Support Fund; AEECA = Assistance for Europe, Eurasia, and Central Asia; IDA = International Disaster Assistance; GHAI = Global HIV/AIDS Initiative

Table 11: FY 2008 Number of People with Access to Improved Drinking Water Supply and Sanitation Facilities, and Liters of Drinking Water Disinfected with Point-of-Use (POU) Treatment Products by Country and Operating Unit			
	# People Access to Improved Drinking WaterSupply	**# People Access to Improved Sanitation Facilities**	**# Liters POU-Disinfected Drinking Water**
TOTAL	**7,739,566**	**6,290,891**	**7,427,182,582**
Africa	**1,195,570**	**579,521**	**5,959,681,782**
Benin	-	-	270,000
Burundi	8,700	-	-
Chad	-	-	60,150
Ethiopia	-	36,120	-
Ghana	68,995	-	-
Kenya	5,600	35,000	1,650,000,000
Liberia	87,000	-	-
Madagascar	-	1,265	1,823,203,500
Malawi	-	-	141,405,432
Mali	14,788	-	-
Rwanda	-	-	69,212,500
Somalia	-	5,298	-
South Africa	-	415,838	-
Sudan	395,880	-	-
Tanzania	228,607	-	-
Uganda	-	-	154,870,400
Zambia	-	-	2,120,659,800
USAID Africa Regional (AFR)	-	68,000	-
USAID East Africa Regional	368,000	-	-
USAID West Africa Regional	18,000	18,000	-
Asia	**2,221,695**	**1,060,750**	**287,167,000**
Afghanistan			212,167,000
Bangladesh	343,438	265,524	-
India	136,718	398,148	-
Indonesia	404,625	180,502	75,000,000
Pakistan	986,734	-	-
Philippines	273,680	44,891	-
USAID Regional Development Mission/Asia (RDM/A)	76,500	171,685	-
Middle East	**3,807,000**	**4,421,475**	**-**
Egypt	50,000	-	-
Jordan*	3,106,000	4,122,575	-
Lebanon	-	253,900	-
West Bank and Gaza	651,000	45,000	-
Latin America & the Caribbean	**464,152**	**229,145**	**9,000,000**
Bolivia	3,570	61,350	-
Ecuador	9,582	4,595	-
Guatemala			9,000,000
Haiti	451,000	163,200	-
Central Programs	**-**	**-**	**1,171,333,800**
USAID Global Health (GH)	-	-	1,171,333,800
Europe & Eurasia	**51,149**	**-**	**-**
Armenia	45,000	-	-
Kosovo	6,149	-	-

*USAID Jordan reported people with "improved supply access" and people with "improved sanitation access."

Table 12: Estimated FY 2008 USAID Obligations for Water Supply, Sanitation, and Hygiene Activities by Operating Unit ($ Millions) *					
Region/Bureau	**Country or Operating Unit**	**Water Supply & Sanitation****	**IDA Water Supply & Sanitation*****	**FFP Water Supply & Sanitation******	**Grand Total**
Africa	Angola	0.995			0.995
	Benin	0.355			0.355
	Botswana	0.200			0.200
	Burkina Faso			0.508	0.508
	Burundi	0.755			0.755
	Chad		1.232	0.567	1.799
	Cote d'Ivoire	0.927			0.927
	Democratic Republic of the Congo	7.033	1.526	6.479	15.038
	Eritrea		1.393		1.393
	Ethiopia	6.049	7.754		13.803
	Ghana	2.325		0.160	2.485
	Guinea-Bissau		0.100		0.100
	Kenya	5.425	1.510	1.442	8.377
	Liberia	2.604		0.497	3.101
	Madagascar	3.602		2.257	5.859
	Malawi	0.323			0.323
	Mali	0.710			0.710
	Mozambique	4.014	0.655		4.669
	Namibia	0.343			0.343
	Niger			0.781	0.781
	Nigeria	3.705			3.705
	Rwanda	0.723			0.723
	Senegal	2.200	0.050		2.250
	Sierra Leone			0.914	0.914
	Somalia	1.727	8.829		10.556
	South Africa	0.990			0.990
	Sudan	22.625	29.140		51.765
	Tanzania	1.995			1.995
	Togo		0.050		0.050
	Uganda	3.878	4.605		8.483
	USAID Africa Regional (AFR)	7.225			7.225
	USAID East Africa Regional	1.000			1.000
	USAID Southern Africa Regional	2.000			2.000
	USAID West Africa Regional	5.000			5.000
	Zambia	2.547			2.547
	Zimbabwe		2.105		2.105
	Development Grants Program (Africa)	10.000			10.000
	Africa Total	**101.275**	**58.949**	**13.605**	**173.829**
Asia	Afghanistan	11.583	2.445		-
	Asia Middle East Regional	2.020			-
	Bangladesh	1.416	1.495	7.000	-
	Burma		2.234		-
	Cambodia	5.283			-
	East Timor	3.270	0.200		-
	India	7.000	0.317		-
	Indonesia	8.431	0.005		-
	Nepal		0.268		-
	Pakistan	6.725	0.760		-
	Papua New Guinea		0.053		-
	Philippines	1.519			-
	Sri Lanka		0.194		-
	RDM/A	6.950			1.000
	Uzbekistan	0.040			0.530
	Vietnam		0.132		4.500
	Asia Total	**54.237**	**8.103**	**7.000**	**0.000**

Table 12 continues on the next page.

Table 12 (cont.): Estimated FY 2008 USAID Obligations for Water Supply, Sanitation, and Hygiene Activities by Operating Unit ($ Millions)*					
Region/Bureau	**Country or Operating Unit**	**Water Supply & Sanitation****	**IDA Water Supply & Sanitation*****	**FFP Water Supply & Sanitation******	**Grand Total**
Central Programs	EGAT	7.660			7.660
	Global Health	5.200			5.200
	Office of Development Programs	6.798			6.798
	Central Programs Total	**19.658**	**0.000**	**0.000**	**19.658**
Europe & Eurasia	Armenia	0.887			0.887
	Azerbaijan	0.020			0.020
	Georgia	0.500	0.750		1.250
	Joint Eurasia Regional	0.290			0.290
	Kosovo	4.500			4.500
	Russia	0.050			0.050
	Europe & Eurasia Total	**6.247**	**0.750**	**0.000**	**0.000**
Latin America & the Caribbean	Bolivia	3.000		0.916	3.916
	Colombia	0.700			0.700
	Dominican Republic		0.100		0.100
	Ecuador	5.787	0.192		5.979
	Guatemala	0.250			0.250
	Haiti	10.060	0.545		10.605
	Mexico		0.901		0.901
	Nicaragua	0.200	0.286	1.484	1.970
	Latin America & the Caribbean Total	**19.997**	**2.024**	**2.400**	**24.421**
Middle East	Asia Middle East Regional	0.100			0.100
	Egypt	1.416			1.416
	Iraq		21.575		21.575
	Jordan	41.700			41.700
	Lebanon	8.000			8.000
	USAID Middle East Regional (OMEP)	3.718			3.718
	West Bank and Gaza	19.162			19.162
	Middle East Total	**74.096**	**21.575**	**0.000**	**95.671**
Total Directive - All Regions		**275.510**	**91.401**	**23.005**	**389.864**

* FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.
** All of these activities meet the 2008 statutory requirements.
*** $61.981 million of the total $91.398 million went toward activities that provided "sustainable" water supply and/or sanitation services and met the 2008 statutory requirements. $35.033 of the $61.981 million supported activities in Africa.
**** PL 480 funds are part of the Food for Peace program and cannot be counted toward the 2008 statutory requirement.

Table 13: Estimated FY 2008 USAID Obligations for All USAID Water Sector Activities (Water Supply, Sanitation, and Hygiene; Water Resources Management; and Water Productivity) by Operating Unit ($ Millions)*

*** FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.**

	Water Supply, Sanitation & Hygiene**	Water Resources Management	Water Productivity	Total
Grand Total	**389.916**	**58.580**	**38.909**	**489.606**
Africa	**173.829**	**12.691**	**25.131**	**211.651**
Angola	0.995			0.995
Benin	0.355			0.355
Botswana	0.200			0.200
Burkina Faso	0.508		1.393	1.901
Burundi	0.755	0.100	0.259	1.114
Chad	1.799		1.000	2.799
Democratic Republic of the Congo	15.038			15.038
Cote d'Ivoire	0.927			0.927
Eritrea	1.393			1.393
Ethiopia	13.803	1.321	14.000	29.124
Ghana	2.485	0.925		3.410
Guinea			0.760	0.760
Guinea-Bissau	0.100			0.100
Kenya	8.377	5.510	0.514	14.401
Liberia	3.101	1.663	0.170	4.934
Madagascar	5.859	0.802		6.661
Malawi	0.323	0.270		0.593
Mali	0.710	0.650	0.950	2.310
Mozambique	4.669	0.300	1.000	5.969
Namibia	0.343			0.343
Niger	0.781		1.563	2.344
Nigeria	3.705			3.705
Rwanda	0.723	0.100		0.823
Senegal	2.250			2.250
Sierra Leone	0.914			0.914
Somalia	10.556			10.556
South Africa	0.990			0.990
Sudan	51.765	1.050	0.500	53.315
Tanzania	1.995		1.050	3.045
Togo	0.050			0.050
Uganda	8.483			8.483
Zambia	2.547		1.672	4.219
Zimbabwe	2.105			2.105
USAID Africa Regional	7.225			7.225
USAID East Africa	1.000			1.000
Middle East	**95.671**	**8.400**	**2.920**	**106.991**
Egypt	1.416			1.416
Iraq	21.575			21.575
Jordan	41.700	7.900	2.500	52.100
Lebanon	8.000	0.500		8.500
Morocco			0.220	0.220
West Bank/Gaza	19.162			19.162
Asia Middle East Regional	0.100			0.100
Middle East Regional	3.718		0.200	3.918

** Total WSSH includes all FY 2008 IDA funding for WSS by country in the total amount of $91.398 million.

Table 13 continues on the next page.

Table 13 (cont.): Estimated FY 2008 USAID Obligations for All USAID Water Sector Activities (Water Supply, Sanitation, and Hygiene; Water Resources Management; and Water Productivity) by Operating Unit ($ Millions)*

*** FY 2008 budget data represent best estimates from USAID analysis of information as of April 2009.**

	Water Supply, Sanitation & Hygiene**	Water Resources Management	Water Productivity	Total
Asia	**69.340**	**24.009**	**3.760**	**97.109**
Afghanistan	14.028	0.110	0.726	14.864
Bangladesh	9.911	3.062		12.973
Burma	2.234			2.234
Cambodia	5.283			5.283
East Timor	3.470	1.400		4.870
India	7.317			7.317
Indonesia	8.436	6.931		15.367
Kazakhstan			0.010	0.010
Kyrgyz Republic			0.810	0.810
Nepal	0.268			0.268
Pakistan	7.485	5.720	2.000	15.205
Papua New Guinea	0.053			0.053
Philippines	1.519	6.786	0.174	8.479
Sri Lanka	0.194			0.194
Tajikistan			0.030	0.030
Turkmenistan			0.010	0.010
Uzbekistan	0.040			0.040
Vietnam	0.132			0.132
Asia Regional	2.020			2.020
Regional Development Mission/Asia	6.950			6.950
Europe & Eurasia	**6.997**	**0.788**	**0.816**	**8.601**
Armenia	0.887		0.210	1.097
Azerbaijan	0.020			0.020
Georgia	1.250		0.566	1.816
Kosovo	4.500			4.500
Moldova		0.108	0.010	0.118
Russia	0.050	0.600		0.650
Ukraine			0.030	0.030
Joint Eurasia Regional	0.290	0.080		0.370
Latin America & the Caribbean	**24.421**	**10.031**	**2.060**	**36.512**
Bolivia	3.916			3.916
Colombia	0.700			0.700
Dominican Republic	0.100			0.100
Ecuador	5.979	0.407		6.386
Guatemala	0.250			0.250
Haiti	10.605	7.212		17.817
Jamaica		0.350		0.350
Mexico	0.901		0.915	1.816
Nicaragua	1.970		1.145	3.115
Panama		0.700		0.700
Latin America & the Caribbean		1.362		1.362
Central Programs	**19.658**	**2.661**	**4.222**	**28.742**
EGAT	7.660	2.661	4.222	14.543
Global Health	5.200			5.200
Office of Development Programs (DGP)	6.798			6.798
Bureau of Democracy, Conflict and Humanitarian Assistance/Office of Foreign Disaster Assistance***				2.201

** Total WSSH includes all FY 2008 IDA funding for WSS by country in the total amount of $91.398 million. *** This amount is for a separate USAID Water Sector category of Disaster Risk Reduction (DRR).

Acronyms and Abbreviations

ABRI: Advancing the Blue Revolution Initiative

ADB: Asian Development Bank

AECEN: Asian Environmental Compliance and Enforce ment Network

AED: Academy for Educational Development

AEECA: Assistance for Europe, Eurasia, and Central Asia (USAID account)

AGWA: Automated Geospatial Watershed Assessment

ASEAN: Association of Southeast Asian Nations

BA: Budget authority

BCWUA: Branch canal water users association (Egypt)

BVC: Beach village committee (Malawi)

CGIAR: Consultative Group on International Agricultural Research

CHW: Community health worker

CIFOR: Center for International Forestry

CRDF: Civilian Research and Development Foundation

CRSP: Collaborative Research Support Program

CSH: Child Survival and Health (USAID account)

DA: Development Assistance (USAID account)

DAF: Development Assistance Framework

DBP: Development Bank of the Philippines

DEED: Developpement Economique pour un Environnement Durable (USAID/Haiti)

DMA: District metering area

DRR: Disaster risk reduction

ECO-Asia: Environmental Cooperation Asia

ESC: Environmentally Sustainable Cities (ASEAN initiative)

ESF: Economic Support Fund (USAID account)

ESP: Environmental Services Program (USAID/ Indonesia)

EU: European Union

EUM: Egypt Utilities Management

FACTS: Foreign Assistance Coordination and Tracking System

FATA: Federally Administered Tribal Area (Pakistan)

FFP: Food for Peace

FIRE-D: Financial Institutions Reform and Expansion Debt

FONAG: Fund for the Protection of Water (Ecuador)

FSD: Fund for Sustainable Development

FY: Fiscal year

GHAI: Global HIV/AIDS Initiative (USAID account)

GIS: Geographic information system

HIP: Hygiene Improvement Project

HSP: Health Services Program (USAID/Indonesia)

HWTS: Household Water Treatment and Safe Storage

ICAA: Initiative for Conservation in the Andean Amazon

ICARDA: International Center for Agricultural Research in Dry Areas

ICRAF: International Centre for Research in Agroforestry

ICRISAT: International Crops Research Institute for the Semi Arid Tropics

IDA: International Disaster Assistance (USAID account)

INRMP: Integrated natural resource management plan

IRF: Infrastructure Reform and Finance (USAID/ Georgia)

IWA: International Water Association

IWMD: Integrated water management district

IWMI: International Water Management Institute

IWRM: Integrated water resources management

JMP: Joint Monitoring Program (United Nations)

Lao PDR: Lao People's Democratic Republic

LDAS: Land data assimilation system

LLDA: Laguna Lake Development Authority (Philippines)

LWPP: Lebanon Water Policy Program

LWWA: Local Water Utilities Administration (Philippines)

MDG: Millennium Development Goal

MJP: Maharashtra Jeevan Pradhikaran (India)

MOH: Ministry of Health

MPA: Marine protected area

MRC: Mekong River Commission

NASA: National Aeronautics and Space Administration

NATO: North Atlantic Treaty Organization

NGO: Nongovernmental organization

NUWSS: Northern Uganda Water Supply Services

OFDA: Office of U.S. Foreign Disaster Assistance (USAID)

OMEP: Office of Middle East Regional Program (USAID)

PCD: Pollution Control Department (Thailand)

PDEIF: Project Development and Efficiency Improvement Fund (Philippines)

PL: Public law

PLI: Pastoralist Livelihoods Initiative (Ethiopia)

POU: Point of use

POUZN: Point of Use Water Disinfection and Zinc Treatment

PPP: Public private partnership

PSI: Population Services International

PWRF: Philippine Water Revolving Fund

RANET: Radio and Internet Technologies for the Com munication of Weather and Climate Information for Rural Development Program

RDMA: Regional Development Mission/Asia (USAID)

RFBR: Russian Foundation for Basic Research

RIAL: Reuse for Industry, Agriculture, and Landscaping (USAID/Jordan)

RUPES: Rewarding Upland Poor for Environmental Services

SANREM: Sustainable Agriculture and Natural Resources Management

SHG: Self help group

SLWE: South Lebanon Water Establishment

SNNP: Southern Nations, Nationalilties, and Peoples (Ethiopia)

SO: Strategic objective

SUCCESS: Sustainable Coastal Communities and Ecosys tems

SUWASA: Sustainable Water and Sanitation for Africa

SWAT: Soil and Water Assessment Tool

SWCIS: State Water Cadastre Information System (Armenia)

SWS: Safe Water System

UNICEF: United Nations Children's Fund

USAID: U.S. Agency for International Development

WADA: Water and Development Alliance

WASH: Water, sanitation, and hygiene

WAWI: West Africa Water Initiative

WHO: World Health Organization

WMO: World Meteorological Organization

WP: Water productivity

WRM: Water resources management

WRMA: Water Resources Management Agency (Armenia)

WSS: Water supply and sanitation

WSSC: Water Supply and Sewerage Company (Vietnam)

WSSH: Water supply, sanitation, and hygiene

WUA: Water users association

WUASP: Water Users Association Support Project

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Water Supply, Sanitation, and Hygiene

Water Resources Management

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