

Annex E: Blue Revolution Initiative

BLUE REVOLUTION INITIATIVE

**STRATEGIC FRAMEWORK FOR ASIA AND THE
NEAR EAST**

Bureau for Asia and the Near East
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Table of Contents

1. Introduction.....	107
2. Overview of Water Resources in the ANE region.....	111
2.1 Near East.....	111
2.2 South Asia.....	112
2.3 East Asia	114
2.4 Transboundary Water.....	114
3. Water Management Challenges and Opportunities	117
3.1 Improve water security by strengthening cooperation on shared waters.....	117
3.2 Improve environmental management and economic productivity of water resources	118
3.2.1 Meeting the Growing Demand for Water	118
3.2.2 Improving the Productivity of Water Used in Agriculture	120
3.2.3 Improving Water Quality Management	121
3.3 Increase access to, and effective use of, safe water and sanitation.....	121
3.3.1 Poor Water Supply and Sanitation Management	121
3.3.2 Expanding Access to and Use of Basic Sanitation	124
4. ANE Response: Launching a Blue Revolution.....	127
4.1 Overview.....	127
4.2 BRI Objectives.....	127
4.3 Principles.....	128
4.4 Priority Areas for Action	128
4.4.1 Mitigate tensions associated with the use and management of shared water	128
4.4.2 Improve environmental management and economic productivity of water resources	130
4.4.3 Improve access to, and effective use of, safe water and basic sanitation	132
Annex 1: Illustrative Country Selection Criteria.....	139

1. Introduction

Water touches all aspects of people's lives and plays a central role in every country's development. Its availability impacts food production and nutrition, city development and growth, income generation and livelihood, and human health and hygiene. Water is also a moving resource. It links lowlands and mountains, and urban populations with rural upland dwellers. Its management reflects the strengths and weaknesses of local, national and international governance systems and the relationships between countries that share water resources.

Our universal need for water means that it can serve as a good medium for engaging citizens in participatory planning and governance around watershed protection and water management, encouraging greater transparency of local and national institutions, and promoting more equitable access to water and related services. Financing water-related infrastructure is proving to be a good vehicle for developing innovative, pro-poor, and more sophisticated financial markets. The need to improve the management of rivers and aquifers is proving to be an effective vehicle for engaging countries in dialog and partnerships that establish the foundation for broad-ranging cooperation on resource use, mutual security, and even trade.

USAID's Asia and Near East region (ANE) extends from Morocco in the West to Mongolia, Philippines and Indonesia in the East. The population of the region, now 3.6 billion and expected to exceed 4.0 billion by 2015, and the concomitant growth in demand for food, jobs, and housing are placing extreme pressures on the region's fresh water resources, and contributes to the severe degradation of existing surface waters. While the region as a whole has plenty of water, the Near East and parts of South Asia face extreme shortages now. With the exception of the oceans, no potential new water resources remain untapped. Countries like Jordan, Kuwait, Libya, Oman, Saudi Arabia, and Yemen are overcoming their shortages by tapping deep, finite groundwater resources or investing in expensive and vulnerable desalination facilities. However, the over-extraction of fossil and replenishable groundwater only ensures fewer future management options. With growing water scarcity comes increased potential for local, national and regional conflicts over water resource allocation, use and contamination. Avoiding these conflicts and meeting the needs of the region's growing population demands using the existing renewable water supplies more efficiently, reallocating water from agriculture for other growing needs, and augmenting existing supplies through better delivery management, demand management, recycling and desalination.

A particular concern is the lack of adequate access to safe water and sanitation for a significant percentage of the region's populations. The ANE region contains three-fourths of the world's population without adequate access to safe water and sanitation services. In spite of decades of achievements through donor, lender and national government investments, approximately 20 percent of the region's population still lacks safe, reliable drinking water and almost 45 percent have no access to hygienic sanitation. This situation particularly impacts the urban and rural poor who suffer disproportionately in terms of the cost of water and impact on their health. Over 500,000 young children die from water-borne diseases in the region each year. Inadequate sanitation has contributed to the extensive pollution of fresh water resources, exacerbating pressure on remaining water resources. In 1990, the world's nations established the millennium development goals (MDGs) that include improving access to safe water and sanitation. To achieve these MDGs, countries committed to reducing by half the number of people without access to safe water and basic sanitation by 2015. Achieving these goals in the ANE region

requires expanding access to safe water and basic sanitation in the ANE region to more than 700 million and 1.3 billion people respectively. In recent reporting, only 6 of the countries in the region are on track to meet this DG target.

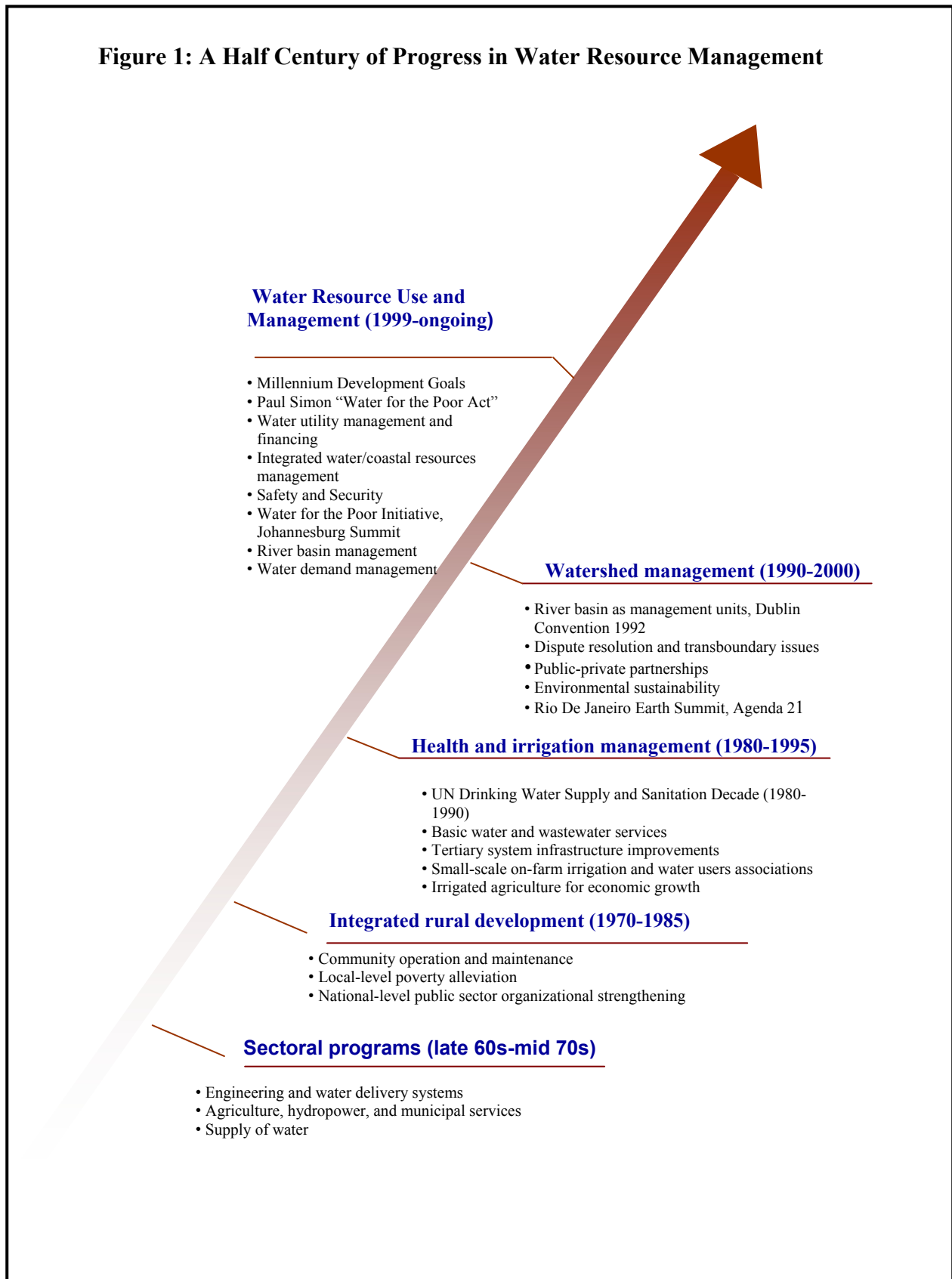
While the situation is challenging, all is not bleak. The region has experienced considerable progress addressing the above challenges over the past fifty years. USAID has played a significant role in much of this progress.

The evolution in water resources management thinking and practice from the sectoral programs of the late 1960s reveals how far we have come and how significant are the challenges that remain, as shown in Figure 1. The trends have changed: from the early single-discipline approaches that focused on supply (the supply of drinking and agricultural water, for example, or of hydropower) and related engineering solutions, to the integrated area development plans of the 1970s—that now seem top-heavy and forgetful of the poor—to the introduction of sanitation and health as parallel streams to water management in the 1980s. This thinking evolved again in the 1990s with the use of hydrological boundaries (such as catchments, watersheds, and river basins) as management units, and the associated realization of the need for transboundary dispute resolution, be those boundaries administrative, jurisdictional, inter-state, or international. In the past few years, the international community has refocused efforts again on providing safe water and basic sanitation to the millions of people that have no access to these essential services. Today, donors like USAID place greater emphasis on improving utility management and mobilizing domestic and international capital through innovative financial approaches to expand infrastructure. Already, we begin to see system security and safe water planning as emerging trends in the sector.

Amid these shifts, the international community has taken notice of the different roles played by men and women in water use. Women have a particularly important role to play in the water sector, as principal providers and carriers of water, as main caretakers of the family's health, and as farmers, fishers, post-harvest processors, and traders. An increasingly high and deserving premium has been placed on understanding the differing roles of men and women within the decision making process related to water resources allocation, price and use. Yet, even after 50 years we continue to see a very small number of women in decision-making positions in the sector.

These shifts in approaches to water resources management reflect USAID's constant learning and adaptation in response to evolving needs, priorities and lessons learned over the past fifty years. They also reflect USAID's intellectual leadership that has helped shape other donor efforts to improve the availability and management of water resources. For example, in drinking water supply and sanitation, USAID expanded the role of the private sector in financing and managing these services by pioneering, in the 1990's, the use of Build-Operate-Transfer (BOT) mechanisms to attract international experience and investment in water services.

Figure 1: A Half Century of Progress in Water Resource Management



More recently, programs like the FIRE-D in India and FORWARD in the Philippines have supported ground-breaking work on water revolving funds and innovative approaches to mobilizing domestic financing for water and sanitation infrastructure.

In transboundary water management, USAID has helped lead efforts to enlist country cooperation and commitment to better management of shared waters. For example, USAID supported efforts to improve the management of the Aral Sea and the Kura-Araks River in the Caucasus. The USAID Regional Development Mission/Asia recently launched an Eco-Asia program that will provide support to the Mekong River Commission and also look for opportunities to improve transboundary water management in South Asia.

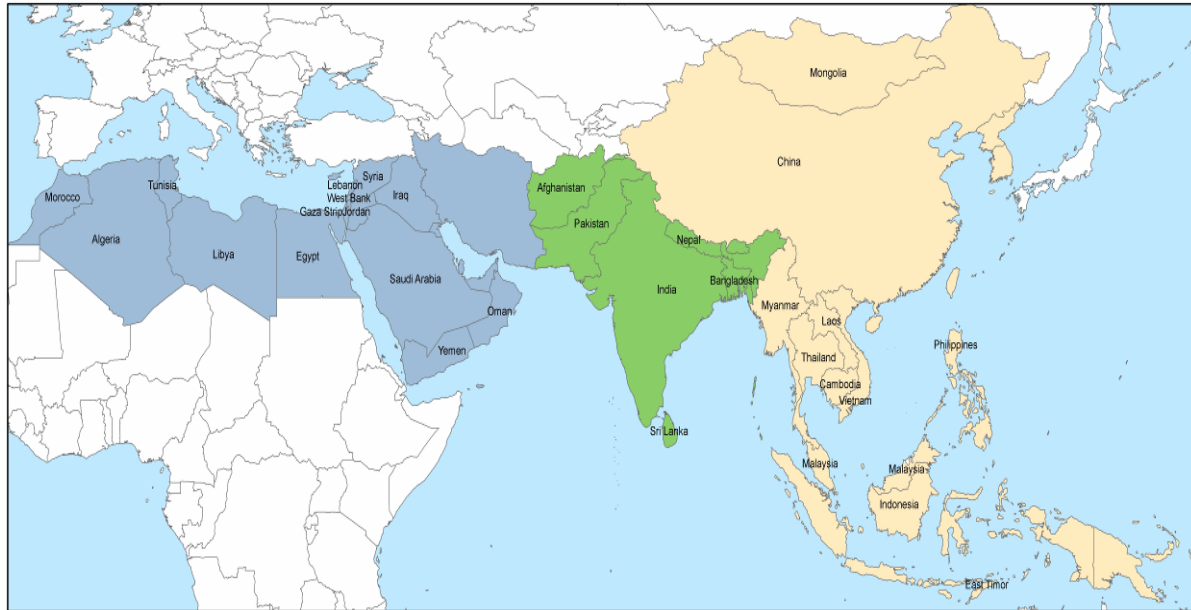
To ensure equitable emphasis on infrastructure access and its hygienic use, USAID developed the Hygiene Improvement Framework which has been endorsed by UNICEF, the International Reference Center on Water Supply and Sanitation in the Netherlands, and the World Bank's Water Supply Program to guide preparation, implementation, and evaluation of integrated water, sanitation, and hygiene programs.

Finally, USAID has focused on the need to improve utility operations and governance if countries are to achieve the MDG targets for water and sanitation. Many USAID offices around the world now support programs to strengthen utility operations and governance, including benchmarking utilities against international performance standards. Examples include ongoing programs in Indonesia, Jordan, Lebanon, and the Philippines. USAID's new regional program, Eco-Asia, also supports the Southeast Asia Water Utilities Network (SEAWUN) and its efforts to promote the adoption of performance benchmarking among SEAWUN's member utilities.

2. Overview of Water Resources in the ANE region

Virtually every country in the region faces significant challenges managing its water resources to balance environmental requirements with growing population and economic demands. In most countries, unabated pollution, especially in urban areas, has significantly degraded water quality further complicating this challenge.

Figure 2: The ANE Region



The region's diversity can be better understood in the context of its three principal subregions: Near East, South Asia and Southeast Asia.

2.1 Near East

The Near East (NE) subregion is the most water scarce region in the world. While it controls 70 percent of the world's known oil reserves, it has less than one percent of the world's renewable freshwater resources. It is defined largely by drought and desert, and suffers from the scarcity of fresh water, uneven availability, a growing gap between supply and demand, deteriorating water quality, and dominance of agricultural water use. Home to five percent of the world's population, the NE has an average per capita annual water supply of 900 m³/person/year that masks extreme shortages in places like Gaza and Jordan that receive less than 150 m³/person/year (Table 1). High population growth rates (average 2.1 percent) increase pressure and competition for scarce water resources and given the region's a history of conflicts could stoke smoldering religious, political and economic tensions.

Agriculture remains an important component of the region's economy, contributing as much as 23 percent to GDP, employing between 25 and 30 percent of the workforce, and consuming more than 80 percent of the total annual water resources. Growing populations and accelerating urbanization, combined with the expanded commercial cultivation of crops with high water demand have stimulated over-abstraction of groundwater resources and degrading water quality. The over-abstraction of surface and ground waters threatens critical aquatic ecosystems in many

countries in the region. For example, the Saddam Hussain regime drained the Iraq marshlands, one of the region's most important wetlands. Today, efforts to restore these marshlands are hampered by the demand for and withdrawals of water from the Tigris and Euphrates upstream

TABLE 1: RENEWABLE WATER RESOURCES IN THE NEAR EAST

Government	Total Available Water/Yr (BCM)	Per Capital Water m ³ /p/yr (2005)	Per Capita Water m ³ /p/yr (2015)	Withdrawals as % of Total Available Water (2005)	% Population with Access to Safe Water & Basic Sanitation (2000)	Withdrawals by Sector		
						Ag	Industry	Domestic
Algeria	14	426	368	36%	87/92	52%	14%	34%
Egypt	58	783	658	114%	98/68	82%	11%	7%
Iraq	75	2,604	2,056	57%	81/80	92%	5%	3%
Jordan	1	175	144	100%	91/93	75%	3%	22%
Lebanon	4	1,118	1,009	32%	100/98	68%	6%	27%
Libya	1	171	142	450%	72/97	84%	3%	13%
Morocco	29	921	802	40%	80/61	89%	2%	10%
Oman	1	390	315	170%	79/89	94%	2%	5%
Saudi Arabia	2	81	65	1,295%	n/a	90%	1%	9%
Syria	26	1,365	1,092	46%	79/77	90%	2%	8%
Tunisia	5	495	449	56%	82/80	86%	1%	13%
West Bank/Gaza	-	-	-	-	94/76	-	-	-
Yemen	4	191	140	72.5%	69/30	92%	1%	7%
Total	220	836	689	80.6%	78/65%	83%	4%	13%

of the marshes for agriculture, urban and industrial needs. In Northwestern Tunisia, the fragile salt balance of the Lake Ichkeul, which provides a unique habitat for migratory waterfowl, is endangered by diversions from its tributary rivers. In the Nile Delta, Lake Manzalah is also threatened by changes in flow patterns and pollution. Azraq oasis in the western part of Jordan, which used to be an important resting point for migratory birds, has already almost completely dried up from overexploitation of the aquifers feeding the oasis. While countries in the Near East, in general, have made excellent progress meeting current demand for water and sanitation services (with the exception of Yemen), they must continue expanding water and sanitation systems to another 62 to 76 million people to meet the MDG goals for safe water and basic sanitation by 2015.

Meeting the needs of the region's growing economies and populations requires both the development of new water resources (i.e. desalination) and reallocating water from agriculture for urban and industrial needs. To shift water from agriculture successfully will require improving the efficiency of water use to maintain and even increase agricultural productivity with less water resources.

2.2 South Asia

South Asia is home to 1.5 billion people. Forty percent of the population earns less than US\$1.00 a day, and accounts for about half of the world's poor. Agriculture is crucial to South

Asia's economies. It employs almost 70 percent of the workforce and generates 32 percent of region's GDP. Expanded adoption of irrigated agriculture along with improved crop varieties and expanded use of fertilizer fueled South Asia's successful green revolution in the 1960's and 70's. For example, irrigated land in India has expanded six-fold to 36 million hectares since 1951. Groundwater now supplies more than half of India's total irrigation water. However, subsidized electricity and water, weak regulation of water allocations, and poor irrigation water management have encouraged the over-extraction of groundwater that has led to falling water tables in many parts of South Asia.

Many people in South Asia still lack access to safe water and basic sanitation. While countries report that approximately 84 percent of their people have access to piped water (Table 2), in many cases this means a standpipe that operates a few hours a day or week, and may be located some distance from an individual's residence. With populations expected to reach 1.7 billion by 2015, achieving the MDGs requires expanding access to safe water and basic sanitation for more than 300 million and 600 million people respectively. Meeting these needs will require a shift of water resources from agriculture to urban and industrial sectors.

TABLE 2: RENEWABLE WATER RESOURCES IN SOUTH ASIA

Country	Total Available Water/Yr (BCM)	Per Capita Water m ³ /p/yr (2005)	Per Capita Water m ³ /p/yr (2015)	Water Withdrawals (% of Total)	% Population with Access to Safe Water & Basic Sanitation (2000)	Withdrawals by Sector		
						Ag	Industry	Domestic
Afghanistan	65	2,177	1,570	40.2%	13/8%	99%	0%	1%
Bangladesh	1,211	8,539	7,202	1.2%	75/48%	86%	2%	12%
India	1,897	1,719	1,505	26.4%	86/30%	92%	3%	5%
Nepal	210	7,740	6,413	13.8%	88/61%	99%	0%	1%
Pakistan	223	1,412	1,153	69.8%	90/54%	97%	2%	2%
Sri Lanka	50	2,411	2,243	19.6%	78/91%	96%	2%	2%
Total	3,656	2,469	2,128	20.1%	84/35%	95%	2%	4%

2.3 East Asia

For our purposes, East Asia includes Southeast Asia, China and Mongolia. This region is home to more than 1.8 billion people. Fortunately, it is blessed with considerable fresh water resources. Inefficient use and poor water management combined with rapid urbanization have led to water depletion in certain areas with greatest demand. China faces the most extreme situation where over abstraction of ground water to meet agriculture, industrial and urban needs in the Northern part of the country have caused a significant drop in river flows and ground water levels. For example, the water table under Beijing has fallen more than 59 meters⁸¹ since 1965. While agriculture generates a shrinking share of GDP in most Southeast Asian countries, it still employs more than 50 percent of the workforce and accounts for more than 80 percent of all water consumed.

According to the WHO, approximately 80 percent of the population in SE Asia has access to improved water supplies and 50 percent to basic sanitation services (Table 3). Meeting the MDGs will require the expansion of safe water and basic sanitation services to an additional 336 million and 581 million people respectively.

TABLE 3: RENEWABLE WATER RESOURCES IN SOUTHEAST ASIA

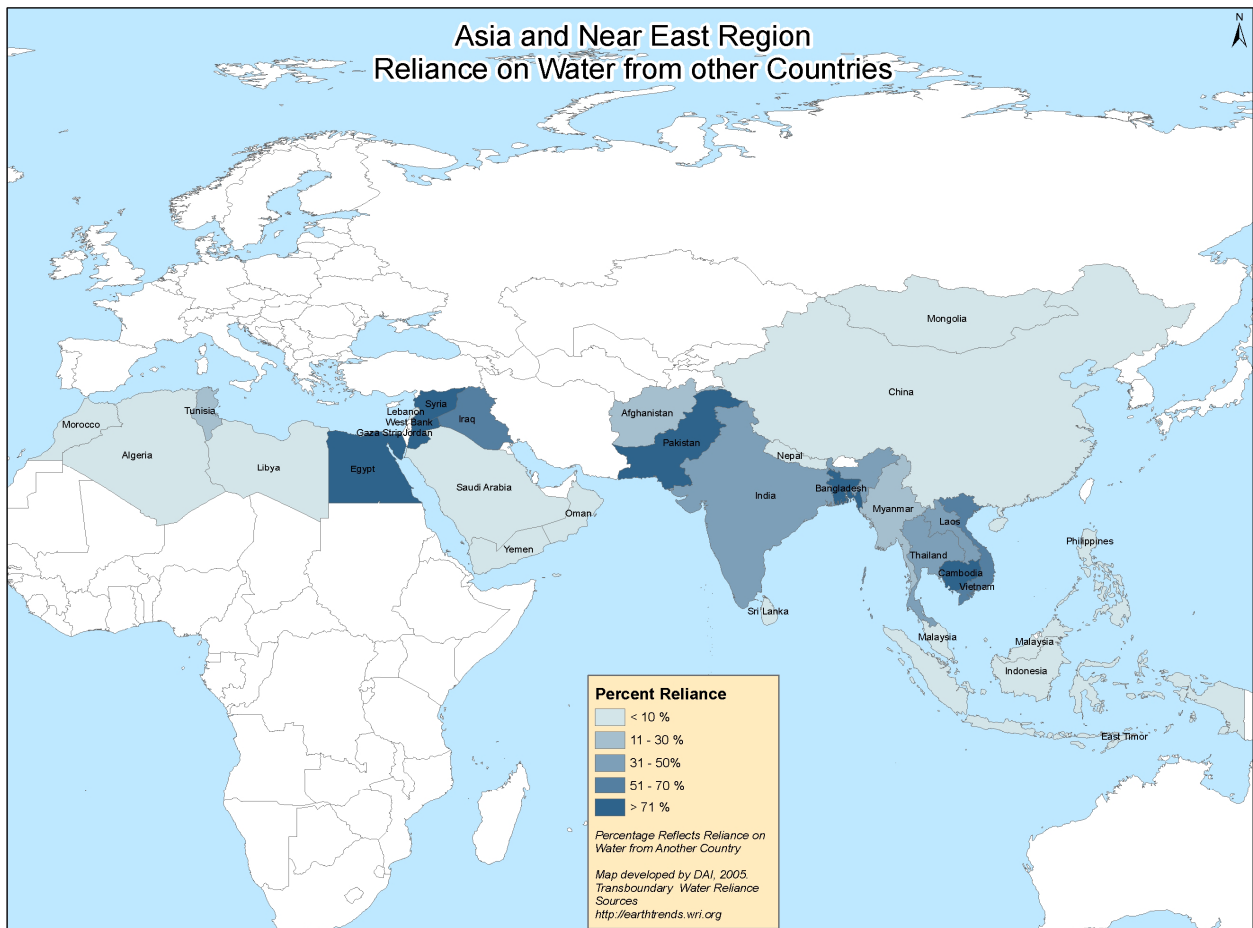
Country	Total Available Water/Yr (BCM)	Per Capita Water m ³ /p/yr (2005)	Per Capita Water m ³ /p/yr (2015)	Water Withdrawals (% of Total)	% Population with Access to Safe Water & Basic Sanitation (2000)	Withdrawals by Sector		
						Ag	Industry	Domestic
Burma	1,046	20,705	19,029	0.4%	80/73	90%	3%	7%
Cambodia	476	33,828	27,892	0.1%	34/16	94%	1%	5%
China	2,830	2,151	2,032	18.6%	77/44	78%	18%	5%
Indonesia	2,838	12,739	11,499	2.6%	78/52	93%	1%	6%
Laos	334	56,381	45,716	0.3%	43/24	82%	10%	8%
Malaysia	580	22,882	19,622	2.2%	95/96	77%	13%	11%
Mongolia	35	13,228	11,714	1.1%	62/59	53	27	20
Philippines	479	5,767	4,946	11.6%	85/73	88%	4%	8%
Thailand	410	6,383	4,314	8.1%	85/99	91%	4%	5%
Timor Leste	-	-	-	-	52/33	-	-	-
Vietnam	891	10,577	13,341	6.1%	73/41	87%	10%	4%
Total	9,919	5,306	4,934	7.7%	77/49	83%	9%	8%

2.4 Transboundary Water

Many countries in the region rely on waters, both surface and subsurface, that originate in another country (Figure 2). Therefore, these countries depend upon the actions or inaction of other nations to meet their water needs. Prominent transboundary rivers in the region include the Nile, Jordan, Tigris-Euphrates, Indus, Ganges, Brahmaputra, Salween and Mekong. Three

⁸¹ James Kynge, "China Approves Controversial Plan to Shift Water to Drought Hit Beijing", Financial Times, 7 January 2000.

Figure 3: Reliance upon Water Coming From Neighboring Countries (UNESCO)



riparian countries, in particular, dominate the management of important transboundary waters and are central players in any efforts to promote effective transboundary water resources management. These are Egypt (Nile River), India (Ganges, Indus, Brahmaputra), and China (Mekong and Red Rivers).

Transboundary aquifers pose another challenge. Several important aquifers exist in the region that are shared by two or more countries. The most important are found in the Near East and include the Northern Sahara or Eastern Erg, the Nubian, and the Saq/Disi. While countries have discussed the management of transboundary rivers for many years, there has been almost no discussion about the management of transboundary groundwater. Given that aquifers lie below the ground, little information exists about their quality and quantity of water, nor their importance to the maintenance of critical wetlands and coastal habitats.

Historically, most riparian countries have unilaterally implemented water development plans and projects with little to consideration of their neighbors needs until they begin to develop a specific project that directly impacts one or more of the neighboring countries. In the absence of relations or institutions to facilitate consultations and resolve potential conflicts, these projects can become flashpoints that heighten tensions and undermine regional stability. In many cases, it requires years and even decades to resolve disputes (i.e., the Indus river treaty took 10 years

while the Indo-Bangladesh treaty for the Ganges River took 30 years, and the treaty on the Jordan River took 40 years to negotiate). While these negotiations take place, history shows that little consideration is given to maintaining and protecting water quality and quantity, or protecting and managing the ecosystem services the water systems provide for dependent populations.

There already exist several treaties between countries that establish basic allocations and/or management principals for shared rivers. In a few cases, countries have formed an organization to share information, carry out research, facilitate a dialog on the management of the river, and in the rare case, oversee the implementation of a treaty (i.e. Mekong River Commission, Indus Water Commission and the Indo-Bangladesh Joint Rivers Commission). These treaties and organizations provide a place to begin to promote information sharing, improved management and conflict resolution over the use and management of shared waters.

The surface and subsurface waters that cross international boundaries present significant challenges to regional stability because political considerations often overwhelm hydrologic needs. While the potential exists for paralyzing disputes in these basins, history shows that water can catalyze dialogue and cooperation, even between especially contentious countries that share a water resource.

3. Water Management Challenges and Opportunities

3.1 Improve water security by strengthening cooperation on shared waters

While the treaties and basic institutional frameworks exist for regional cooperation in water resources management, in reality little actual coordination takes place between the riparian countries in the region. For example, currently India, China and Turkey are building dams on the Indus, Mekong and Tigris/Euphrates respectively that will impact downstream riparians, yet there has been little consultation on these dams. More problematic, especially in the water-scarce Middle East and North Africa, no system exists for managing transboundary aquifers that countries like Libya and Algeria depend upon for their water supplies. Many countries view discussion and cooperation on transboundary water management as limiting their future options. This attitude poses a significant challenge, but successful examples from around the world can guide USAID's investments in improved transboundary water management.

Opportunities

Historical evidence shows that shared water resources can serve as a catalyst for cooperation. UNESCO's Potential for Conflict to Cooperation Potential (PCCP) program identified the following lessons learned from global experience in managing international water resources:

- Water crossing international boundaries can cause tensions between nations that share the river basin. While tensions have rarely led to actual conflict, early coordination between riparian states can help avoid potential conflicts.
- Once international institutions are in place, they have proven tremendously resilient over time, even between hostile riparian nations, and even when conflict is waged over other issues.
- More likely than the occurrence of violent conflict is the gradual degradation of water quality and/or quantity that over time can affect the internal stability of a nation or region and act as an irritant between ethnic groups, water sectors or states/provinces.

Countries that do successfully coordinate the management of transboundary waters have put in place:

- Adaptable management structures and institutions that allow for public input, changing basin priorities and new information and monitoring technologies;
- Clear and flexible criteria for water allocations and water quality;
- Systems for equitably distributing benefits from water use (rather than equitable use or allocation) as witnessed by the recently established Nile Basin Initiative; and
- Clear mechanisms for resolving disputes even after treaties are negotiated and signed.

Building upon these lessons, USAID can, in coordination with other donors, support the organization and strengthening of both transboundary and national institutions that support the management of transboundary waters. For example, in the case of the dams being built by Turkey, India and China, the riparian countries that share these rivers have already formed regional organizations, a good first step towards greater cooperation. While China has not yet joined the Mekong River Commission (MRC), it does participate in MRC meetings as an observer, and there are increasing efforts by the other MRC members to secure China's membership in this organization. Similarly, India and Pakistan

already coordinate the management of the Indus. This relationship provides the basis for resolving potential issues with the new dam being planned by India on the Indus river system. After about four decades of tension between Egypt and the upper Nile countries and despite current hostilities among a number of countries, Nile riparian states are progressively moving toward a shared vision for cooperative, sustainable water resources management. USAID could support other efforts in the Near East like the Arab Water Council's activities to improve the management of aquifers, and the Tri-Partite commission's efforts to begin cooperation on the management of the Tigris-Euphrates rivers. By supporting efforts to improve coordination of management plans and sharing of information, best practices and eventually joint planning among countries that share common water resources, USAID could make a significant contribution towards improving water resources management across the region.

Lessons Learned

Governance is local but it becomes regional when linked to specific transboundary concerns such as severe water quality degradation with direct impacts on human health. Regional cooperation works best when all countries, especially the most powerful, gain from collaborative actions.

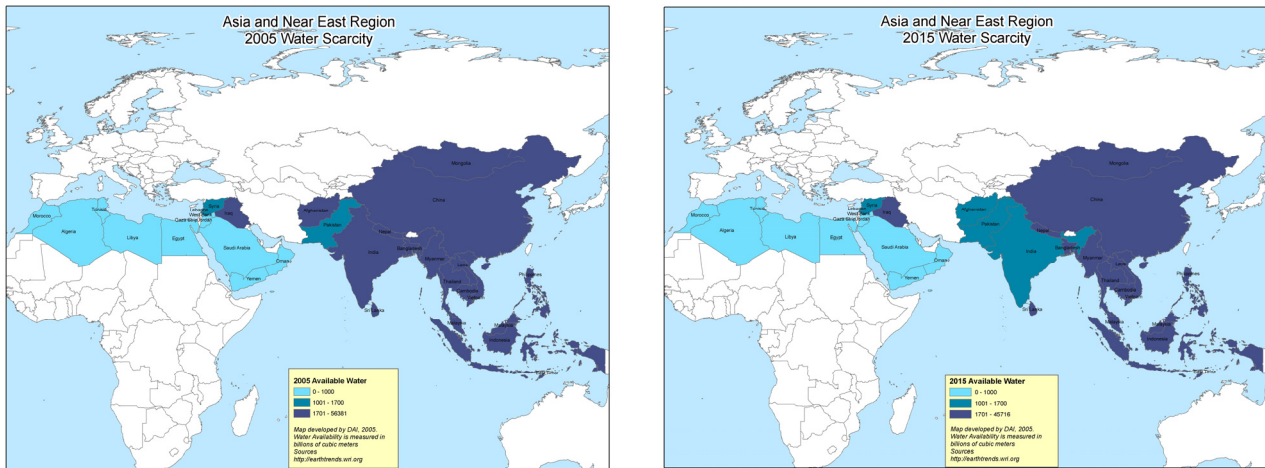
Partnerships and networks are useful vehicles to share knowledge and information, but they need close management and must deliver concrete services to be valued by donors, national governments, and members.

3.2 Improve environmental management and economic productivity of water resources

3.2.1 Meeting the Growing Demand for Water

The overall demand for water resources across the region increases daily, driven by population growth and expanding economies. This is most noticeable in the Middle East and North Africa, and parts of South and East Asia that already face water stress and scarcity. Many countries currently meet water demand by pumping water from underground aquifers – both renewable and fossil, at a rate that cannot be sustained. Countries must balance water demand or risk future reduced water availability that could impact their growing population's needs, sustain food production, and preserve critical riparian habitats. The two maps below show the expected increase in water scarcity (less than 1,000 m³/person/day) and water stress (less than 1,700 m³/person/day) by country between 2005 and 2015 (Figure 3). The greatest change occurs in South Asia. These country averages mask extreme scarcities that exist within individual countries in South and Southeast Asia.

Figure 4: Water Stress and Scarcity in the ANE Region in 2005 and 2015



Dark blue – countries with plentiful water ($> 1,700 \text{ m}^3/\text{person/day}$)
Medium blue – countries with water stress ($< 1,700 \text{ m}^3/\text{person/day}$)
Light blue – countries with water scarcity ($< 1,000 \text{ m}^3/\text{person/day}$)

Opportunities

Meeting this growing demand requires that countries conserve existing supplies through water demand management, increase the efficiency of water use, and augment existing supplies through development of new or underused sources of water.

Improve water demand management in urban centers.

Water demand management involves using prices, technology and incentives to encourage more efficient use of scarce water resources. Effective management of water demand can enable utilities to reach more customers with better quality services while postponing new investments in expensive bulk water facilities. Opportunities exist in every country to improve water demand management. Building upon experience gained in the electricity sector, some countries have begun to look at how they can use pricing, allocations and incentive programs to encourage more efficient water use at the household, commercial and industrial levels.

Expand existing water supplies through desalination and reuse of wastewater.

The region, especially the Near East has some of the best experience in the world in both desalination and wastewater reuse. Countries in the region currently produce close to 50 percent of the world's desalinated water and have pioneered the use of wastewater for irrigation and industrial purposes. This experience provides an excellent foundation upon which to share country experiences with those countries that are just beginning to face water stress and scarcity

3.2.2 Improving the Productivity of Water Used in Agriculture

With the exception of Lebanon, agriculture remains the largest user of water resources in every country across the region (Table 4 illustrates the level of water used in agriculture in selected countries). Agriculture's contribution to overall gross domestic product diminishes each year, yet it still remains a significant economic force employing a high percentage of the work force, contributing to national food security, and providing relatively stable sources of foreign exchange that many countries depend upon to fuel their economic development.

Most countries place low value on water used for agriculture. The low cost of water combined with the lack of regulation of groundwater abstraction and, subsidized electricity in countries like India, encourage poor water management and productivity. In countries with plentiful water resources, this poses minimal problems. However, as more countries face growing water stress, the needs of growing urban and industrial sectors will be met by reallocating water from agriculture. This can be accomplished with minimal impact on overall agricultural productivity provided that countries institute the policy, regulatory and institutional changes that encourage and help farmers to use water more efficiently.

Table 4: Water Allocated to Agriculture and Role of Agriculture in the Economy

Country	% Water Allocated to Agriculture (2004)	% Ag Contribution to GDP (2003)	% Employment in Agriculture (2004)
Egypt	82	16	32
Jordan	75	2	11
Morocco	89	17	35
Bangladesh	86	22	54
India	92	22	59
Pakistan	97	23	46
Indonesia	93	17	47
Philippines	88	14	48
Vietnam	87	22	67

Opportunities

Many countries across the region are now focusing on the importance of improving water use efficiency in agriculture. Jordan, for example, is reorganizing its agricultural extension and research institutions to provide better support to farmers in on-farm water management. Other countries are studying the use of market-based approaches, either through water pricing or specific allocations to encourage greater water use efficiency by farmers. Increasing the price for water has proven to be a significant challenge in most countries across the region. The Philippines is attempting to establish a basic bulk water rate that would apply to all consumers including farmers. In other countries, like Jordan, governments are finding it easier to consider

specific water allocations to encourage greater efficiency among farmers. Both approaches offer opportunities to improve the productive use of water in agriculture.

3.2.3 Improving Water Quality Management

Uncontrolled solid disposal practices and lack of treatment of domestic and industrial wastewater treatment, in addition to agrochemical contamination further reduces the availability of freshwater water suitable for domestic and agriculture use, and also affects public health, particularly of children. The problem is most acute in rural areas where many people still lack access to clean water and basic sanitation.

Opportunities

- Many countries in the region are moving towards improving solid waste management
- Increased wastewater treatment coverage and reuse of recycled water offer will reduce pollution of natural river courses.
- Improved fertilizers-pesticide management via agricultural extension will control agrochemical pollution of surface and groundwater.

3.3 Increase access to, and effective use of, safe water and sanitation

3.3.1 Poor Water Supply and Sanitation Management

Over the past fifty years, governments and donors alike have focused most resources on expanding water systems to meet the needs of growing populations. In spite of impressive investments in water distribution systems, most utilities still do not service their entire franchise areas. Performance benchmarks for several large utilities across the region reflect these problems as evidenced by the high levels of non-revenue water (NRW), extremely low tariffs, high staff/connection ratios and low billing/collection ratios (Table 5). The problems facing many utilities across the region can be traced to political intervention in utility operations, the lack

of regulation, the use of broad-based subsidies, and the reliance on grants and low-interest loans from national governments and donors for new infrastructure development.

Lessons Learned

- **Weak utility management undermines the effectiveness of new investments in water services.** Many utilities, such as Delhi's, are investing in new bulk water supplies. Meanwhile, they continue to operate with high levels of non-revenue water. Utilities need to reduce non-revenue water as one means to meet growing demand.
- **Women and girls bear a disproportionate share of the burden for water collection.** This responsibility significantly reduces their time available for family, income-generating, and educational activities. Women must have a say in the design and prioritization of new water projects and the opportunity to provide customer feedback on utility performance.
- **Investing in water and sanitation services makes good economic sense.** World Health Organization (WHO) analyses demonstrate that every dollar invested by poor countries in safe, clean water supplies generates a sevenfold benefit in reduced healthcare costs and increased productivity.

Table 5: Urban Water and Sanitation Management in Selected Cities in ANE

City	Water Coverage (%)	Sewer Access (%)	24-Hr Avail. (%)	NRW (%)	Ave Tariff (US\$/m ³)	Metered Connections (%)	Working Ratio	Revenue Collect. Efficiency (%)	Staff per 1000 connections
Amman	97	78	0	52	0.65	100	0.71	n/a	6
Bangkok	72	29	100	37	0.23	100	0.30	n/a	4
Casablanca	100	70	100	34	n/a	n/a	n/a	n/a	6
Colombo	69	33	60	36	0.22	70	.52	95	8
Delhi	69	60	1	53	0.07	33	2.45	78	20
Dhaka	72	30	0	40	0.06	51	0.89	82	12
Ho Chi Minh	84	12	75	38	0.18	100	1.13	99	4
Jakarta	51	2	92	51	0.29	99	0,80	98	5
Karachi	58	50	0	30	0.09	1	1.00	54	8
Kathmandu	83	22	0	37	0.09	38	1.04	70	15
Manila	58	7	88	62	0.14	100	1.22	97	4
Phnom Penh	84	41	100	34	0.24	100	.46	100	5
Sana'a	65	22	0	50	0.25	n/a	n/a	n/a	10
Vientiane	63	0	50	28	0.04	100	1.10	77	11
International Best Practice	100	100	100	Less than 20		100	0.68	100	4

Lack of Regulation: In most cities across the region, the entities in charge of water supply and sanitation also have responsibility for implementing government policies and regulations. This self regulation rarely works well. Elected officials frequently involve themselves in the development and management of water supplies, eliminating the autonomy water utilities need to manage their systems, accounts and personnel. Political involvement in utility operations generally results in low tariffs and overstaffing. Low tariffs and self regulation lead to high levels of non-revenue water and large numbers of urban poor without service. Good economic regulation – that focuses on investment, tariffs and service levels can achieve three basic objectives.

- Provide the utility with autonomy to operate as an independent business.
- Review the prices charged by the utility to ensure they achieve pro-poor and equity objectives while enabling the utility to achieve full cost recovery.
- Hold the utility accountable for achieving specific performance measures.

Widespread Use of Broad-Based Subsidies: Many countries subsidize water for both agricultural and all urban consumers as part of a pro-poor development agenda. However, evidence shows that these broad-based subsidies fail to improve the affordability of water for the poor. In many cities across the region, the poor have limited to no access to the public water system and end up paying much higher prices for water than the rich. For example, poor households

Lesson Learned

Subsidized water prices rarely benefit the poor. Most poor people, especially in South Asia, do not have access to piped water in their homes. Therefore, they do not benefit from the highly subsidized lifeline tariff rates charged by many utilities. Subsidies should be geared toward expanding access.

that are not connected to water systems in India and the Philippines pay prices 10 to 50 times higher to purchase water from tankers and hand carts. Broad-based subsidies encourage wasteful practices, undermine the financial sustainability of the water systems, and place significant burdens on the scarce fiscal resources of national and local governments. For example, many city governments in the Philippines spend more than half their total annual revenues covering the operating and maintenance costs of their city-operated water utilities.

Limited Public Sector and Donor Resources to Meet Need for New Infrastructure: Water infrastructure is ultimately paid for by any or a combination of three parties: water users through fees and charges, taxpayers through local and national fiscal flows, and aid donors including private grant funds. On the average, governments across the region invest less than half the resources needed to meet their water and sanitation objectives. A recent report by the Asian Development Bank estimated that to halve the number of people with no access to safe water and sanitation in Asia alone will require an additional \$8.0 billion per year over and above current investment levels⁸². Governments and donors cannot meet this demand. The remaining option is to attract investment from international and national private sectors to meet this demand like is being tested in India and the Philippines. This approach requires the use of creative financing engineering approaches that match investor needs for competitive rates of return with utility needs for loan terms and tenors suited to long-term capital investments. Successfully attracting private sector investment demands improvements in utility governance and operations as well as better designed projects.

Opportunities

Many governments are now beginning to address these problems. They recognize that water utilities should at least cover their operating and maintenance costs if not full capital depreciation costs, and that doing so can postpone expensive capital investments in new water supplies, and improve the ability of utilities to expand water and sanitation services to all households within their franchise area. Several countries are looking at ways to strengthen utility management, establish effective regulation, price utility services on a more cost recovery basis, and develop creative approaches to attract private sector investment in the expansion of water and sanitation infrastructure. For example, the Government of Jordan placed the city of Amman's utility under private management and is now looking at privatizing the utility. In Indonesia, Lebanon and Jordan efforts are underway to strengthen the management of the countries utilities. In addition, the Philippines government has established a water regulatory authority, is reorganizing the national water utility authority, and designing a new financing facility that will blend private sector and donor resources to expand the pool of financing available for water and sanitation infrastructure.

The above actions reflect the changing environment and new opportunities emerging across the region to strengthen utility operations and management. Doing so will enable utilities become credit worthy

Pooled Financing in Tamil Nadu, India

The state of Tamil Nadu in southern India incorporated the Water and Sanitation Pooled Fund in August 2002. The Fund mobilizes debt financing from the private domestic capital market for priority urban infrastructure. The state gave a grant to fund the debt service reserve and USAID provided a back-up guarantee through its DCA. The Fund finances and refinances water and sanitation projects of small and mid-sized towns. The Fund has successfully mobilized debt market capital for local water and sanitation infrastructure, and offers lower-cost financing and longer tenures without the need for the government guarantees.

⁸² Asia Water Watch 2015. Nov. 2005

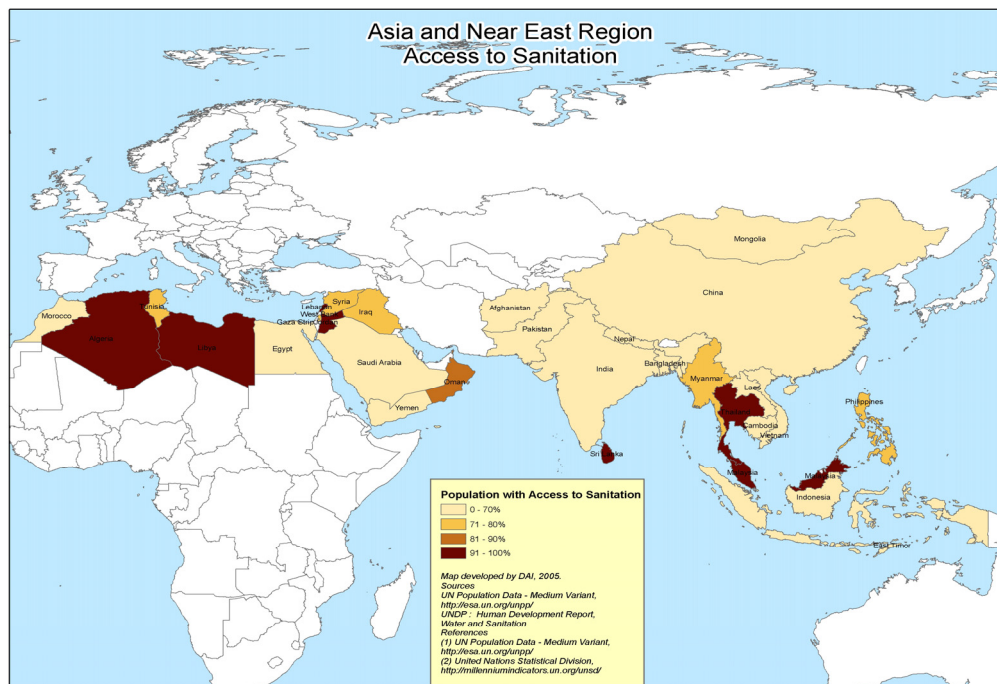
and able to expand their own systems far faster than could be accomplished through only donor and national government grants and loans.

3.3.2 Expanding Access to and Use of Basic Sanitation

Approximately 56 percent or 2.0 billion people lack access to basic sanitation infrastructure across the region (Figure 4). An even smaller percentage protect their health through hygienic use of existing facilities. Several factors contribute to this situation: poorly capitalized water utilities, limited emphasis placed on sanitation by national governments and donors, weak and poorly enforced building codes and sanitation regulations, general lack of public awareness and concern, and the perception of a low public willingness to pay for sanitation services.

Table 5 above also shows the percent of people connected to sewer systems in major cities across the region. It highlights the overall lack of investment in basic wastewater infrastructure in most countries, but masks the fact that few of these sewers reach well operated treatment facilities. In place of centralized sewers and waste treatment facilities, many countries now rely on households and businesses to effectively manage human wastes. Weak to non-existent sanitation building codes and limited enforcement combined with a lack of waste treatment infrastructure and poor public understanding of the need for basic sanitation has contributed to the widespread contamination of the environment that now threatens the health and well being of a large percentage of the region's population.

Figure 5: Population with Access to Basic Sanitation



Peri-urban areas represent particularly unique challenges to improving sanitation. Many of these areas are slums characterized by poor site conditions, unreliable water availability, high population density, heterogeneous populations, and the lack of legal land tenure. These conditions make the current technical and social solutions for low-cost sanitation currently used in rural communities not necessarily appropriate for improving community sanitation in peri-urban areas.

Opportunities

Resolving the current situation requires the coordinated effort of national governments, donors, NGOs and the private sector. There are successful examples of how countries have improved sanitation, especially for the urban and rural poor using relatively low-cost approaches. The solutions are not just technical. Addressing these problems has proven to require the skills of engineers, legal specialists, financial analysts, social scientists, urban planners and a wide range of institutions. Successful past efforts demonstrate the following lessons:

- **Waste management is gender-centered.** Men and women value sanitation very differently. Women put much higher priority on sanitation than men, given their responsibility as key family providers of health and hygiene services.
- **The starting point is the household.** In the absence of public sanitation systems, people provide their own solutions. People will pay for sanitation to have cleaner surroundings, privacy, and less gastrointestinal disease. The household-centered approach has proven successful (people are able to choose a facility that responds to their needs), cost-effective (physical plant is small-scale), and sustainable (investment is privatized). In many peri-urban areas, the focus must move beyond the household to the entire community since individual households will not experience improved health if their neighbors still contaminate the environment with their fecal matter.
- **Changing hygiene behaviors is key.** Most past programs have emphasized the construction of infrastructure. We now know that without adequate social preparation in advance of construction, infrastructure alone is insufficient to reduce health hazards. Successful programs integrate infrastructure with promotion of a small selection of key behaviors that make sanitation desirable and contribute directly to maximizing its health impact.
- **Governments must facilitate good decision making at the household level.** By establishing standards and creating an enabling environment that encourages private-sector involvement and allows households to select from a variety of technologies governments can promote demand for sanitation systems and encourage the use of appropriate technology and management of wastes at the household, community, and city levels. Combined with facilitating better decision making at the household level, governments must also provide for the necessary waste treatment infrastructure – whether through government or private investment, to improve the management and treatment of wastes. In peri-urban environments, especially where household solutions are not feasible, citizen involvement and community participation are critical to successful sanitation programs. Conceptualization, design and construction of peri-urban sanitation systems require the skills of interdisciplinary teams with planners, social scientists, lawyers, economists, environmentalists and engineers. Community participation has proven critical to increased acceptance, cost recovery and effective operation and maintenance

These lessons provide a beginning point for more concerted actions to improve access to basic sanitation across the region. What remains lacking is how these lessons get factored into long-range municipal plans that combine improving access at the household level with city-wide

efforts to improve sewage and septage management. This is an area that many countries are now struggling to address.

Water Contamination and Water-Borne Diseases

Water contamination by fertilizers and pesticides; lack of sewage and sanitation infrastructure, and the indiscriminate dumping of municipal and industrial wastes into canals, rivers, and lakes has reduced the availability of suitable freshwater water for domestic and agriculture use and increased the cost of water treatment. Poor quality water, inadequate water supplies combined with and poor sanitation and hygiene have led to the re-emergence of water borne diseases as a significant health threat. For example, outbreaks of cholera are becoming more common, and the growing threat of water-borne disease has contributed to the high environmental disease burden across the region (Table 6). This disease burden impacts human security and disproportionately falls on children. Water-based, water-borne, and water-related diseases cause approximately 500,000 children deaths each year in the ANE region, a human tragedy, as well as adversely impacting worker productivity and consuming a significant percentage of many countries' health budgets.

Table 6 : Environmental Burden of Disease for selected ANE Countries/Subregions

Country	India	China	East Asia/Pacific	Middle East	(For Comparison) USA
Lost Disability Adjusted Life-Years per 1000 Population	86	33	58	77	14

Studies show that every dollar invested in safe water and basic sanitation yields economic returns between \$3.00 and \$34.00. A key link between improved water supply and effective sanitation infrastructure and health is through hygiene behavior. Over the past five decades, USAID and other donors have demonstrated that three important hygiene behaviors can significantly improve health:

- Safe handling and storage of drinking water, including, if necessary, disinfection of drinking water at the point-of-use (POU) can reduce diarrhea by 30-40 percent;
- Optimal hand washing can decrease diarrhea prevalence among children by an average of 40 percent; and
- Sanitary disposal of human feces can reduce diarrheal disease prevalence by 30 percent or more.

Opportunities exist within USAID to better integrate investments in hygiene and sanitation, environmental management and utility operations and management to reduce water contamination and water-borne diseases.

4. ANE Response: Launching a Blue Revolution

4.1 Overview

To avert conflict and meet the basic human needs for water will require bold, concerted action by governments, water users, donors, and the private sector working in partnership to transform water management. In response, the ANE Bureau is launching a “Blue Revolution Initiative” to promote water security, prosperity and health in Asia and the Middle East. Given the magnitude of the challenge, achieving success requires a veritable “blue revolution.” This Blue Revolution Initiative (BRI) provides a framework to guide USAID’s future water-related investments in the ANE region, and facilitate coordination and partnership with other donors, non-government organizations and the private sector as USAID teams with countries to overcome these significant challenges

The BRI directly supports the objectives of the Senator Paul Simon Water for the Poor Act of 2005. The Act makes the provision of affordable and equitable access to safe water and sanitation in developing countries a component of U.S. foreign assistance programs. The BRI provides a framework for translating the requirements of the law into action in the ANE region.

4.2 BRI Objectives

While water programs are a vital element of USAID’s development assistance in the ANE region, they are a component of a broader U.S. effort aimed at transformational development that helps build and sustain democratic, well-governed states that will respond to the needs of their people and conduct themselves responsibly in the international system. Improving broad-based access to safe water and sanitation contributes directly to this goal by protecting human health, responding to humanitarian crises, promoting economic development, and enhancing security.

The Director of Foreign Assistance, USAID, and the Department of State are currently undergoing a reorganization of their U.S. foreign assistance programs. The ANE Bureau is working closely with the Director of Foreign Affairs to identify appropriate interventions, develop metrics for measuring and reporting progress, identify priority countries, and develop timelines for projects and programs. The BRI strategic framework is designed to support this process, promoting overall coherence to ANE water sector programming, and guiding the development of projects and programs that can contribute effectively to U.S. foreign policy and transformational development goals.

Within this context, the objectives of the Blue Revolution Initiative are to:

- Mitigate tensions associated with the use and management of shared water;
- Improve environmental management and economic productivity of water resources; and
- Improve access to, and effective use of, safe water and basic sanitation.

4.3 Principles

The Blue Revolution Initiative builds upon past USAID and other donor investments and experiences and will support the further development, testing and adoption of new approaches to address the region's priority water challenges. While many approaches encompassed in this strategy reflect the best practices and lessons learned from the past fifty years, others reflect new, "revolutionary" approaches that emphasize:

- Identifying and mitigating water conflicts at the local, national and regional/transboundary levels. Conflicts are expected to emerge from water shortages and declining water quality in many countries across the region. Their mitigation demands that countries approach the management of surface and ground waters from a more integrated perspective. USAID will provide support to regional institutions that support transboundary water management and build their capacity to engage in regional cooperation, conflict mitigation, and improved management of waters at the river basin level.
- Improving water productivity. The successful shift of water from agriculture to meet growing urban and industrial needs requires improving the multiple, productive use of water (more crop per drop) to maintain food security, nutrition and economic well being.
- Building partnerships with the private sector to expand access to safe water and basic sanitation while improving household hygiene. The relevant MDG target cannot be met by public investment alone, and many private sector entities have corporate interest in sustainable and affordable sources of clean water.

4.4 Priority Areas for Action

4.4.1 Mitigate tensions associated with the use and management of shared water

Nearly one-half of the world's land surface consists of river basins shared by more than one country, and more than 200 major rivers cross national borders. Few institutional or management systems are in place for effectively addressing water disputes or for managing shared water resources. As countries press against the limits of available water, the possibility of conflict will increase. Where water shortages coincide with other sources of tension, such as in the Middle East and South Asia, the threats to regional security are increasingly worrisome.

Under the BRI, USAID and the US Department of State (DOS) will work with other donors and international organizations to support development of frameworks for cooperation and coordination. Such frameworks foster adoption of a shared vision and participatory design and implementation of activities that help ensure equitable distribution of the benefits from water among stakeholders.

Working through national, regional, and global processes, USAID and STATE will work together with other partners to build institutional capacity, political will, and international commitments to improve water security by strengthening cooperation on shared waters.

Examples of activities include:

- Strengthen baseline information on water quality and quantity, and seasonal/inter-annual variations in flows for both rivers and aquifers that can be used by stakeholders for monitoring changes and for the development of national and regional management plans;
- Improve information sharing among riparian countries, especially on water quality and quantity, droughts and floods, and national plans for water use;
- Strengthen the capacity of both regional and national organizations engaged in the monitoring and management of shared waters to use information; and
- Improve the networking and communications among stakeholders about the management of shared waters, and support dialogues that address specific conflicts around uses of shared waters.

Expected Outcomes

Improved baseline information on water quantity and quality and seasonal/inter-annual variations in flow of shared waters. Efforts would strengthen the capacity of organizations in each country to gather information on water quality and quantity of river/aquifers, and help countries develop systems and infrastructure for sharing this information on a timely basis. One outcome will be the development of a uniform set of information that all riparian countries can use for management planning, monitoring of changes, and to improve flood and drought forecasting and response.

Strengthened or new institutions and networks established that promote joint planning and management of shared waters, and dispute resolution. At the regional level, opportunities exist to learn from functioning and respected regional river basin organizations like the Mekong River Commission and other regional platforms like the Arab Water Council to share data, support a dialogue among members, and help resolve conflicts between countries over shared waters. Under the BRI, USAID and State will work with others to identify opportunities where USG assistance can improve information sharing among their members, support management planning and the periodic review and adjustment of plans, identify areas of concern, and help the organizations address conflicts among stakeholders over the use and management of shared waters.

Strengthened national-level governance institutions involved in the development of plans for the management of shared waters. The ability of governments to jointly plan and manage shared waters depends upon the capacity of their organizations responsible for water management. The BRI would strengthen the ability of national governments to participate in, and represent their country interests at, regional discussions on the management and use of shared waters. Their leadership would be made possible by building their ability to monitor, plan and manage shared waters. Efforts would focus around collecting and managing water quantity and quality data for use in decision-making, planning and conflict resolution, and sharing among these organizations examples and experiences from around the world on the successful information-based management of shared waters.

Agreements established or strengthened to promote cooperation on shared waters. Where possible, the BRI would, in coordination with others, help promote, strengthen or establish new agreements between countries around the use and management of shared waters. For example, under the BRI, USAID could support regular meetings between countries to discuss the management of shared waters, based on the model of the Tripartite Commission on the Tigris-Euphrates. One objective of such meetings would be to review existing agreements and work on

changes that will resolve issues with water allocation, pollution, and overall river basin management.

4.4.2 Improve environmental management and economic productivity of water resources

Because fresh water is a finite resource, its protection from pollution and inefficient use are complementary solutions to its conservation and to poverty reduction. USAID, in coordination with BRI partners, will support watershed-based approaches by national and local government to protect fresh water supplies, and improve the productivity of water used in agriculture. This broad objective encompasses many of USAID's ongoing programs in the Near East and Asia.

Examples of activities include:

- Strengthen national government policies and regulation to protect the quality of surface and groundwater.
- Introduce payment for environmental services and other innovative approaches to generate sustained financing for watershed and land management.
- Promote joint planning and cooperation on water use planning and management at regional, national, district, and local levels
- Reduce use of water for irrigation in water-short countries
- Increase use of alternative water supplies for agriculture and industrial purposes
- Adoption of multiple-use planning in water sector planning and management

Expected Outcomes

More “Crop Per Drop” from irrigated agriculture. Currently, few farmers in the region use water resources in the most efficient ways. Too often, irrigation is so poorly managed that over-irrigation of crop lands has led to perched water tables and increased soil salinity making land unusable for crop production. Successfully reducing the amount of water consumed for agricultural production while still meeting the region's food needs will require that: (1) countries to assess and possibly revise the amount of water allocated to the agriculture sector; and (2) farmers adopt more efficient technologies and water management practices. Both are available to the smallholder and agribusiness, but their widespread adoption has not occurred. USAID will support national government efforts to:

- Assist national governments and irrigation water user associations in designing policies, regulations and strategies for pricing and allocating water resources that provide farmers with incentives to switch crops, use water saving technologies and improve on-farm water management.
- Assess where farmers receive information about technologies, integrated efficient water use-increased crop production practices, and work in partnership with the private sector, NGOs and national research and extension systems to improve access to information for farmers.
- Introduce and promote more efficient irrigation technologies and on-farm water management techniques to farmers with special attention to pro-poor technologies and techniques targeting smallholder poverty. This will include building the capacity of farmers, farmer

associations, and national government extension agencies to improve irrigation system and on-farm water management.

- Improve the regulation of wells and ground water abstraction and eliminate or significantly reduce subsidies on other key inputs like electricity to encourage farmers and agribusiness to use water more efficiently;
- Support national government efforts to develop water use plans and design and carry out monitoring systems for tracking progress.

Securing water supplies and improving urban and industrial water use efficiency.

Opportunities exist to expand existing water supplies, especially in those countries facing water scarcity. Specific approaches applicable to selected locations will depend upon factors of cost, availability and technical capacity to carry them out. For example, under the BRI, USAID will work with national governments and other donors to examine and implement options such as:

- **Water Demand Management:** Improving water demand management, especially in urban environments and by industry can help countries significantly stretch existing water supplies, usually at much lower cost compared to the development of new bulk water facilities. In many cities around the region, non-revenue water exceeds fifty percent. According to international best practices, this should be less than 20 percent. The difference reflects losses to leakage, theft and/or the provision of water to un-metered users – like standpipes in slums. Instituting effective water demand management requires appropriate policies and regulations, appropriate incentives for domestic, commercial and industrial users, and the institutional capacity to support incentive programs and enforce regulations.
- **Desalination:** The Near East has a long history of using desalinated sea and brackish waters for urban water supplies. Countries in the NE currently produce close to 50 percent of the world’s desalinated water to satisfy their municipal and industrial water demands. We expect reliance on desalinated water to increase, especially in Jordan, Israel, West Bank Gaza, and in North Africa as countries exhaust freshwater alternatives. The affordability of desalination technology has improved significantly, while environmental concerns remain. This technology is particularly viable where low cost energy can fuel distillation and reverse osmosis processes, currently costing approximately US\$ 0.70 per cubic meter for seawater and closer to US\$ 0.50 for brackish water.
- **Treated Wastewater Reuse:** The reuse of treated wastewater for agricultural, industrial, and environmental purposes can help conserve fresh water resources and protect sensitive downstream environments. Wastewater sources include industrial discharges, urban effluent and thermal power stations. Countries have shown the benefits of treated wastewater use for a wide range of purposes, from supplementing potable water supplies (i.e. Singapore) to agricultural production, toilet flushing and industrial cooling water. Over the past two decades, several countries in the Middle East and North Africa have expanded the use of wastewater for irrigation and industrial purposes. The ratio between the use of freshwater versus treated wastewater for agriculture varies between insignificant in Lebanon to about fifty percent in Jordan. It is about ten percent in Tunisia. Expanding treated wastewater use further requires improving and building new collection, treatment and distribution systems as well as regulatory environments that maintain public health.

USAID is well positioned to help countries carry out overall water balance assessments, and within these determine how best to augment current water supplies using water demand management, desalination and/or wastewater recycling. USAID also will work with regional organizations and national governments in the Near East to promote regional water re-use and management, and build the capacity of institutions in the region to provide training in desalination and water recycling/re-use.

Improved protection and management of surface and groundwater resources. These activities will build upon ongoing USAID efforts in several countries across the region to improve river basin planning and management. USAID will work with other donors, national governments, private sector and non-government organizations to strengthen planning, management and monitoring of surface and groundwater quality and quantity. Activities will be aimed at:

- Strengthening national government policies and regulation to protect the quality of surface and groundwater resources;
- Improving the capacity of national and local governments, and stakeholder groups to monitor water quality and quantity used by different sectors of the economy.
- Promote and support dialogue among local and national government agencies around the protection of surface and groundwater quality and quantity. Help support the formulation of agreements for improving the management of these waters.
- Establish bridges linking improve land management and biodiversity conservation with water source protection.
- Help governments test approaches to integrate upstream and downstream water users, like the payment for environmental services that can generate sustained funding for land management improvements and better waste management by households, farms and communities to protect water supplies.

4.4.3 Improve access to, and effective use of, safe water and basic sanitation

Under this objective, USAID will work with national governments, other donors, the private sector and NGOs to expand access to safe water and basic sanitation across the ANE region. Specific efforts will depend upon the existing country situation, and the principal local constraints to achieving the MDGs. As shown in Tables 7 and 8, many countries in the region appear to be on-track to achieve the MDGs, but the unserved population remains very large. This national information also masks significant differences in levels of service within countries, the quality of service, and constraints such as mobilizing the necessary financing for required infrastructure, reaching the poor with affordable and effective services, and the need to achieve improvements at the household level that will improve overall sanitation and hygiene.

USAID will focus its efforts on: improving access to financing for expanding water and sanitation infrastructure, improving the effectiveness of utility operations, working through public-private partnerships to improve household hygiene and sanitation, and expanding sanitation services in the underserved peri-urban and urban areas in selected countries.

Examples of activities include:

- Improve effectiveness of water utility operations including strengthening corporate governance and management, private sector participation, performance contracting, corporatization, demand management and reduction of unaccounted for water;
- Increase mobilization of domestic financing for water infrastructure and service expansion;
- Support behavior-centered approach to hygiene and sanitation improvement, focusing on prevention of diarrheal disease; and
- Expand environmental sanitation in underserved urban areas, including improved septage management.

Table 7. Progress toward MDG Target for Safe Water in the ANE Region

Government	1990	2003	2015 Goal	Population w/o Access to Safe Water (2003)	Per Capita GNI (2004)	Country Classification	GNI Growth Rate (2000 - 2004)
Afghanistan	6%	13%	53%	25,980,810	360	Low Income	17.3%
Bangladesh	71%	75%	86%	35,455,500	440	Low Income	5.3%
India	68%	86%	84%	154,471,940	620	Low Income	5.7%
Nepal	75%	80%	88%	5,426,600	260	Low Income	3.6%
Pakistan	83%	90%	92%	15,793,500	600	Low Income	4.1%
Sri Lanka	68%	78%	84%	4,562,800	1,010	Low Income	4.1%
Cambodia**	20%	34%	50%	9,286,860	320	Low Income	5.9%
China	70%	77%	85%	302,644,120	1,290	Low Income	8.5%
Indonesia	71%	78%	86%	49,011,820	1,140	Low Income	4.6%
Lao PDR	25%	43%	63%	3,376,680	390	Low Income	5.7%
Mongolia	62%	62%	81%	1,005,480	590	Low Income	4.5%
Philippines	87%	85%	94%	12,458,100	1,170	Low Income	4.6%
Thailand	81%	85%	91%	9,634,950	2,540	Lower Middle Income	5.0%
Timor Leste	25%	52%	63%	432,000	550	Low Income	3.8%
Vietnam	72%	73%	86%	22,744,260	550	Low Income	7.1%
Egypt	94%	98%	97%	1,480,660	1,310	Low Income	3.9%
Iraq	83%	81%	92%	5,473,330	-	Low Income	N/A
Jordan	98%	91%	99%	513,270	2,140	Lower Middle Income	5.1%
Morocco	75%	80%	88%	6,295,600	1,520	Low Income	3.8%
Tunisia	77%	82%	89%	1,818,360	2,630	Lower Middle Income	4.5%
West Bank-Gaza	90%	94%	99%	222,120	1,120	Low Income	-9.5%
Yemen.	69%	69%	85%	6,502,250	570	Low Income	3.8%



- Proposed priority governments for initial BRI support in **Bold**

	Countries on track to achieve the MDGs in safe water supply.
	Estimated baseline and other values

Table 8. Progress toward MDGs for Sanitation in the ANE Region

Government	1990	2003	2015 Goal	Population w/o Access to Basic Sanitation (2003)	Per Capita GNI (2004)	Country Classification	GNI Growth Rate (2000 - 2004)
Afghanistan	0%	8%	50%	27,473,960	360	Low Income	17.3%
Bangladesh	23%	48%	62%	73,747,440	440	Low Income	5.3%
India	12%	30%	56%	772,359,700	620	Low Income	5.7%
Nepal	57%	61%	79%	10,581,870	260	Low Income	3.6%
Pakistan	38%	54%	69%	72,650,100	600	Low Income	4.1%
Sri Lanka	70%	91%	85%	1,866,600	1,010	Low Income	4.1%
Cambodia	10%	16%	50%	11,819,640	320	Low Income	5.9%
China	23%	44%	62%	736,872,640	1,290	Low Income	8.5%
Indonesia	46%	52%	73%	106,934,880	1,140	Low Income	4.6%
Lao PDR	10%	24%	55%	4,502,240	390	Low Income	5.7%
Mongolia	25%	59%	63%	1,084,860	590	Low Income	4.5%
Philippines	54%	73%	77%	22,424,580	1,170	Low Income	4.6%
Thailand	80%	99%	90%	642,330	2,540	Lower Middle Income	5.0%
Timor Leste	10%	33%	55%	603,000	550	Low Income	3.8%
Vietnam	22%	41%	61%	49,700,420	550	Low Income	7.1%
Egypt	54%	68%	77%	23,690,560	1,310	Low Income	3.9%
Iraq	81%	80%	91%	5,761,400	-	Middle Income	N/A!
Jordan	80%	93%	90%	399,210	2,140	Lower Middle Income	5.1%
Morocco	57%	61%	79%	12,276,420	1,520	Low Income	3.8%
Tunisia	75%	80%	88%	2,020,400	2,630	Lower Middle Income	4.5%
West Bank-Gaza	70%	76%	85%	1,665,900	1,120	Low Income	-9.5%
Yemen	21%	30%	61%	14,682,500	570	Low Income	3.8%

- Proposed priority countries for initial BRI support in **Bold**

 Countries on track to achieve the MDGs in sanitation
 Estimated baseline and other values

Expected Outcomes

Increased mobilization of domestic financing for water supply and wastewater collection/treatment. Meeting the Millennium Development Goals (MDGs) will require the mobilization of significantly greater investments in water and sanitation infrastructure by national and local governments and by households. Achieving these goals will also require governments and donors to broadly apply the designs, technologies and approaches that have proven successful at expanding services to the poor. Local governments will play a significant role in these efforts through public education, ordinances, adoption of proven and affordable approaches, and promoting an environment that encourages greater private sector involvement in water and sanitation service provision. USAID will work closely with other donors like the World Bank, WSP, ADB and JBIC to:

- Learn from and design innovative approaches that will attract domestic private sector investment for water and sanitation infrastructure using water revolving funds and pooled financing vehicles. USAID will use its Development Credit Authority (DCA) guarantee facility with these efforts to expand the overall availability of financing for water and sanitation infrastructure.
- Where high connection fees and limited access to financing impede poor households from connecting to existing water and sanitation systems, USAID will work with utilities and the micro-finance institutions to design and implement cost effective solutions that overcome these impediments.
- Support policy and advocacy programs that stimulate greater private sector involvement in the provision of water and sanitation services and equipment, encourage greater investment by households in improved sanitation infrastructure, and promote better collection and storage of water by households.

Improved effectiveness of utility operations. Significant gains have been and still can be made in water utility management across the region. A handful of innovative leaders can inform and guide regional programs. Gains in efficiency and demand management can postpone expensive capital investments in new water supplies. For example, increasing price to reflect real cost, connecting consumers to meters, registering all connections and improving billing and collections has shown to cut water use by 20 – 40%. A key step will involve helping governments make utilities more independent and holding utilities more accountable for meeting performance standards. Under the BRI, USAID will:

- Work with national governments to improve the targeting of pro-poor water subsidies and provide utilities with greater autonomy to manage their operations, and set tariffs and staff salaries in return for performance improvements including expanding and improving services to poor populations within their franchise areas.
- Work in coordination with other donors and national governments to strengthen or help establish regulatory agencies that can effectively monitor water utility operations and performance, review and approve tariffs that meet both pro-poor and full cost recovery objectives, and hold utilities accountable for achieving specific performance benchmarks.

- Work with utilities, and associations of utilities to improve operation and financial performance. Efforts will specifically target improving customer orientation and relations, reducing non-revenue water and improving billings and collections to achieve full cost recovery. As part of this effort, help utilities design and test approaches for reaching the poor, unserved or underserved populations within their franchise area. USAID will build upon successful examples and test new approaches for providing poor neighborhoods with services (i.e. helping establish new organizations within slums for water/sanitation service delivery as has been done in parts of India, Sri Lanka and Manila).
- Work with national and state/provincial level governments and utilities to develop and implement water safety plans (WSPs). Developing WSPs requires a comprehensive risk assessment and risk management approach in water supply from catchment to consumer. A well managed WSP will ensure good drinking water supply, minimize contamination of source waters, reduce or remove contamination through treatment processes, and prevent further contamination during storage, distribution and handling. WSPs provide a powerful tool for the drinking water supplier to manage the supply safely and assist surveillance by public health authorities.
- At the regional level, USAID will help strengthen regional organizations like the Southeast Asia Water Utilities Network that work with member utilities to strengthen performance benchmarking standards, and to share lessons learned improving water utility operations.

Expanded public-private partnerships for improved household hygiene and sanitation practices. USAID will explore opportunities to work with both international and national private companies like Unilever, Coca-Cola, Levis, etc. to change household sanitation practices and potentially enlist private sector support to expand access to safe water and basic sanitation in areas where company employees live. Efforts could encompass a range of activities including:

- Sanitation and hygiene promotion to improve household understanding/knowledge about the importance of hygiene, hand washing and sanitation at the household and community level and to change household hygiene practices. (i.e. Hindustan Unilever example).
- Promote partnerships between companies and local governments to expand safe water and sanitation services into poor neighborhoods in close proximity to company factories.
- Involve companies in policy dialog on wastewater quality regulations and the role infrastructure and policies play in improving the country's competitiveness and attractiveness to multi-national investment in manufacturing facilities.

Improved environmental sanitation in underserved urban areas, including septage management. USAID will work with other donors like the ADB, World Bank and WSP to broaden the range of technology, knowledge and management choices that poor households and communities can use to manage wastewater and septage. USAID can support activities that:

- Make existing knowledge on approaches to peri-urban and household level sanitation solutions more accessible;
- Support the development of statistics that describe the residents of unserved urban and peri-urban areas and their needs;
- Share the practical implications of applied research within and among countries;

- Design and implement activities that bring sanitation to the urban poor; and
- Document the experiences of those carrying out sanitation activities in urban poor and peri-urban poor areas.

Annex 1: Illustrative Country Selection Criteria

Objective 1: Mitigate tensions associated with the use and management of shared water

Determinants of Priority Water Resources

- Water resources shared by at least two countries under increasing stress.
- At least one country has exhibited interest improving the management of the water resources, such as by building/strengthening basis for planning, monitoring and cooperation on transnational waters.

Country/River System	Faces Water Scarcity/Stress in next 10 years	Expressed Interest in Transboundary Water Mgt.
Mekong (Cambodia, China, Laos, Thailand and Vietnam)	None of the countries face immediate stress, but flooding and drought create seasonal problems.	MRC already formed, sharing data. China not a member.
Indus (India, Pakistan)	Both countries face water stress in the Indus basin	Indo-Pak agreement to share river resources already in-place
Tigris-Euphrates (Iran, Iraq, Turkey, and Syria)	All countries face water scarcity	Conversations are underway to discuss shared water challenges.

Objective 2: Improve environmental management and economic productivity of water resources

Determinants of Priority Countries

- Per capita water availability now and in 10 years.
- Percent of water consumed by the agriculture sector and water productivity of agriculture sector.
- Objective supports US Foreign Policy priorities.
- Ongoing or recently ended USAID investments in improving water productivity or integrated water resources management

Country	Per Capita Water Availability		Percent Water Used by Ag Sector	Water Productivity (m ³ used/\$ Ag Contrib. to GNI)	Existing USAID Investments
	Today	2015			
Afghanistan	2,177	1,570	99	n/a	Yes, in agriculture productivity, flood control and irrigation system rehab.
India	1,719	1,505	92	3.1	No
Pakistan	1,412	1,153	97	7.0	No
Indonesia	12,739	11,499	93	1.6	Yes, in integrated watershed mgt
Philippines	5,767	4,946	88	3.5	Yes, in integrated watershed mgt
Iraq	2,604	2,056	92	n/a	Yes
Jordan	175	144	75	3.0	Yes, in improved on-farm water management and greater use of treated wastewater in agriculture
Lebanon	1,118	1,009	68	0.4	Yes, in integrated river-basin planning
Yemen	191	140	92	1.5	None

Objective 3: Improve access to, and effective use of, safe water and basic sanitation

Determinants of Priority Countries

- Percent of population without access to safe water and basic sanitation
- Childhood mortality rate
- Commitment to achieving the MDGs
- Objective supports US Foreign Policy priorities
- Ongoing or recently ended USAID investments in improving water productivity or integrated water resources management

Country	Percent of Population with Access to Safe Water	Percent of Population with Access to Basic Sanitation	Childhood Mortality Rate	Existing USAID Investments
India	86	30	87	Yes, FIRE-D
Pakistan	90	54	103	Yes
Indonesia	78	52	41	Yes, ESP and Eco-Asia
Philippines	85	73	36	Yes, ECO-GOV, FORWARD and Eco-Asia
Vietnam	73	41	23	Yes, Eco-Asia
Egypt	98	68	39	Yes, new Secondary Cities project
Jordan	91	93	125	Yes, WDM and WAJ/FAS
WB/Gaza	94	76	39	Yes